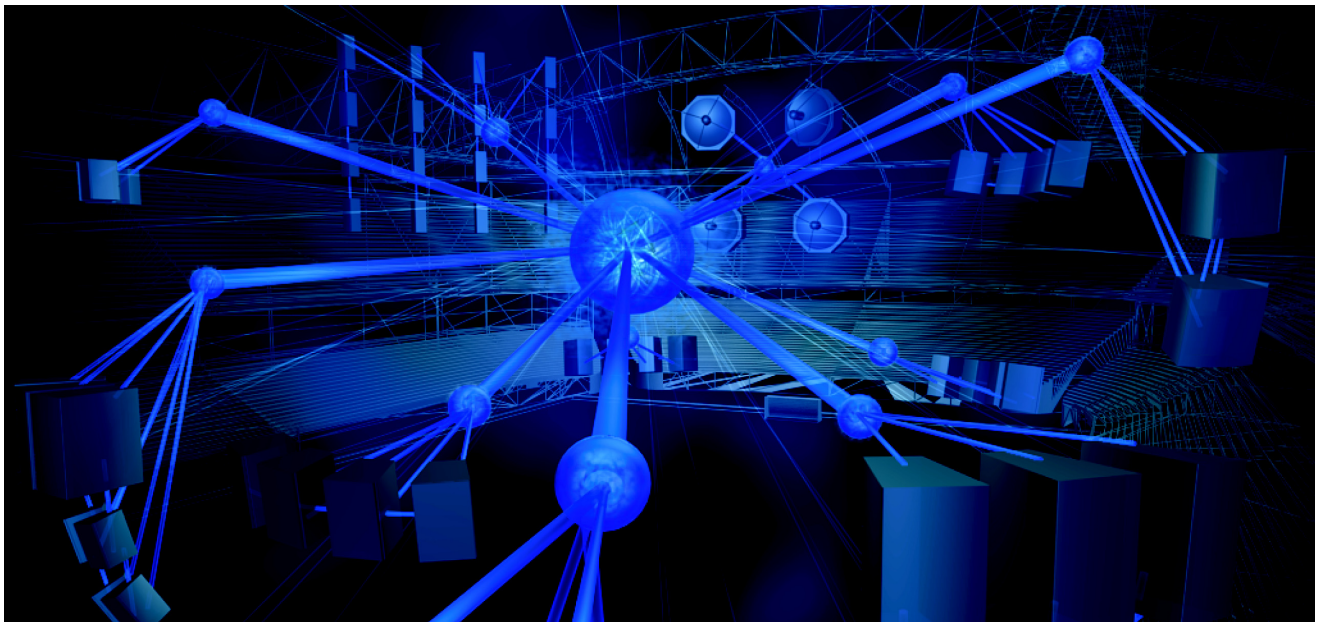
RMS™ Remote Monitoring System 5.2

thinking sound Meyer Sound



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RMS Remote Monitoring System User Guide

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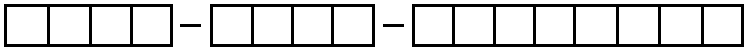
Part Number: 05.033.302.10 A

Enter your serial number (located on the RMS Installer disc sleeve) here:



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CHAPTER 1: INTRODUCTION

This introductory chapter includes the following topics:

- "How to Use This Manual" on page 5
- "RMS Requirements" on page 5
- "About the RMS Network Platform" on page 6
- "About the RMS Software" on page 6
- "Workflow for RMS Configurations" on page 7

HOW TO USE THIS MANUAL

Make sure to read this user guide in its entirety before configuring an RMS™ system. In particular, pay close attention to material related to safety issues.

As you read this user guide, you will encounter the following icons for notes, tips, and cautions:

NOTE: A note identifies an important or useful piece of information relating to the topic under discussion.

TIP: A tip offers a helpful tip relevant to the topic at hand.

CAUTION: A caution gives notice that an action may have serious consequences and could cause harm to equipment or personnel, or could cause delays or other problems.

Information and specifications are subject to change. Updates and supplementary information are available on the Meyer Sound website:

http://www.meyersound.com

Meyer Sound Technical Support is available at:

- **Tel:** +1 510 486.1166
- **Fax:** +1 510 486.8356
- **Email:** techsupport@meyersound.com

RMS REQUIREMENTS

Meyer Sound loudspeakers equipped with an RMS module can be connected to RMS networks and controlled and monitored with the RMS software. Some Meyer Sound loudspeakers come standard with an RMS module while others offer it as an option. For more information, visit the Meyer Sound website.

RMS Software System Requirements

The RMS software system requirements include:

- Microsoft® Windows 2000 sp4, Windows XP sp2, or Windows Vista (32-bit systems only)

  NOTE: RMS can be run on a Mac running Windows XP under Boot Camp® (included with Leopard®) or Parallels™.

- 500 MHz Pentium® III; Pentium IV or faster recommended
- 256 MB of RAM; 512 MB recommended
- 55 MB of hard drive space
- CD or DVD drive for software installation
- 800 x 600 display; 1024 x 768 recommended
- Internet access for RMS upgrade downloads

Supported Network Interfaces

The following network interfaces are supported by RMS:

- **Echelon® PCLTA-20 Network Interface Card** — Requires a 32-bit PCI card slot, half- or full-size.
- **Echelon PCLTA-21 Network Interface Card** — Requires a 32-bit PCI card slot, half- or full-size.
- **Echelon PCC-10 Network Interface Card** — Requires a Type II PC (PCMCIA) card slot.
- **Echelon U10 USB Network Interface Adapter** — Requires a USB 2.0 port.
- **Echelon i.LON 10® Ethernet Adapter** — Requires an Ethernet (RJ-45) port.

  NOTE: The Echelon PCC-10 Network Interface card is not compatible with the following laptop computers: Dell™ Latitude C610, Gateway® Solo 5300, and Toshiba Satellite Pro 4600, 7600, and 8100.

  NOTE: RMS cannot be run from a wireless tablet or computer via an i.LON 10 Ethernet Adapter.

Additional Networking Hardware Requirements

Depending on the number of loudspeakers in the RMS network, as well as the length of cabling used, additional networking hardware — such as repeaters, terminators, switches, or hubs — may be required. In some cases, multiple network interfaces (i.LON 10s) may be recommended. For more information, see Chapter 5, “Connecting RMS Networks.”

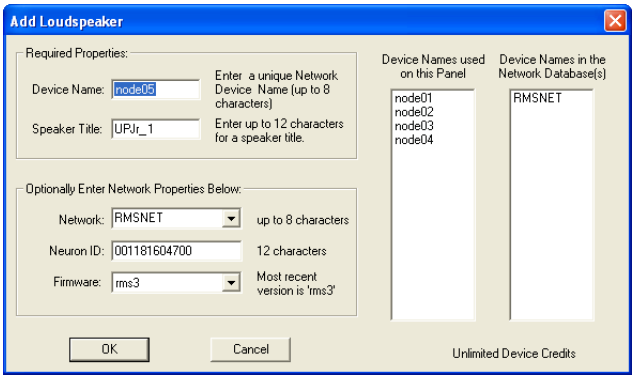
ABOUT THE RMS NETWORK PLATFORM

RMS uses an established network platform developed by Echelon Corporation, the world’s leading supplier of networking technology for sensing, monitoring, and control. The networking platform supports Free Topology, is polarity insensitive, does not require coaxial or fiber optic cabling, and is not affected by power losses at loudspeaker nodes.

An RMS network is a real-time data acquisition system, which means that no data is lost during transmission. A standard RMS network with twisted-pair connections allows up to 50 nodes of self-powered loudspeakers (up to 100 with a repeater). Several hundred nodes are allowed with Ethernet-based configurations.

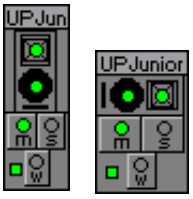
ABOUT THE RMS SOFTWARE

The RMS software provides extensive system status and performance data for each loudspeaker, including amplifier voltage, limiting activity, power output, fan and driver status, as well as mute and solo capability. Loudspeakers are added to the RMS network and assigned a node name during a one-time commissioning procedure where the loudspeaker is identified by either entering its unique Neuron ID or by pressing its Service button.



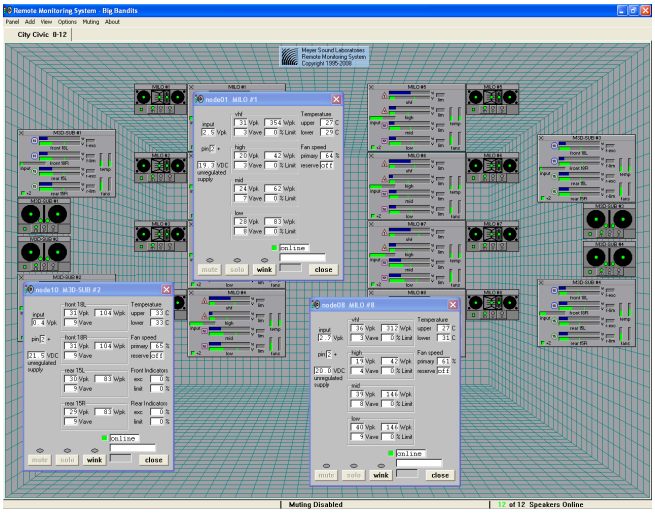
RMS Add Loudspeaker Dialog Box

Once loudspeakers are identified on the RMS network, they appear in the RMS software as icons and views; they are also automatically added to the RMS database on the host computer.



RMS Icons

The RMS software displays all loudspeakers on the network in a panel with icons, Meter views, and Text views that can be customized to suit your needs. Loudspeaker data is updated 2–5 times per second. Individual loudspeakers can be physically identified with the Wink option in RMS, which lights the Wink LED on the RMS module for that particular loudspeaker. Conversely, a loudspeaker can be identified in the RMS software by pressing the Service Pin on the loudspeaker’s RMS module.



RMS User Panel

Loudspeaker icons and views can be arranged to represent how the loudspeakers have been deployed in the system. Multiple panels can be saved and recalled for specific performances and venues.

WORKFLOW FOR RMS CONFIGURATIONS

To configure an RMS network, use the following steps:

1. Install the RMS modules in the loudspeakers, if they have not already been installed (see Chapter 2, “The RMS Module”).
2. Make a note of each loudspeaker’s Neuron ID. The Neuron ID, which is displayed on each loudspeaker’s RMS user panel, is required when adding the loudspeaker to an RMS panel. You can use the datasheet on page 67 of this user guide for creating a list of loudspeakers in the setup.
3. To enable mute and solo capability for the loudspeakers, install the Mute Jumpers (see “Installing the Mute Jumper” on page 15).
4. Install the RMS software (see Chapter 3, “Installing the RMS Software”). If you are upgrading your RMS software, first back up any RMS databases and panel files.
5. Write down your RMS software serial number (located on the RMS Installation disc sleeve) and keep it in a safe place. A space is provided for the serial number on the inside cover of this guide.
6. Install your Echelon network interface (PCLTA-20/21, PCC-10, U10, or i.LON 10) and configure any necessary control panels. For more information, see Chapter 4, “Installing and Configuring Network Interfaces.”
7. Connect the RMS network: install cabling and any repeaters and hubs (if necessary) between the loudspeakers and network adapters. For more information, see Chapter 5, “Connecting RMS Networks.”
8. Launch RMS and add and commission loudspeakers. Save the panel file. For more information, see Chapter 6, “Using the RMS Software.”

CHAPTER 2: THE RMS MODULE

When equipped with an RMS module, Meyer Sound loudspeakers can be connected to an RMS network and monitored with the RMS software. Some Meyer Sound loudspeakers, such as the M-Series loudspeakers, come standard with the RMS module already installed. For other Meyer Sound loudspeakers, the RMS module is available as an option that can either be factory installed or installed at a later date by a qualified service technician.

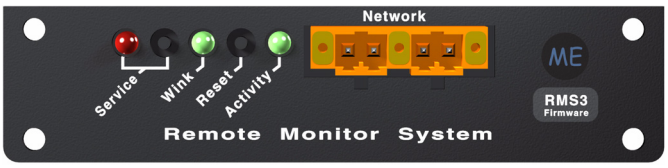
The following sections document the basic features of the RMS module, as well as how to install it:

- "About The RMS Module" on page 9
- "Resetting the RMS Module" on page 10
- "Installing the RMS module (UltraSeries Loudspeakers)" on page 10
- "Installing the RMS Module (MP and HP Amplifier Loudspeakers)" on page 11
- "Installing the Mute Jumper" on page 15

NOTE: RMS-equipped loudspeakers include a Mute Jumper that can be installed to enable the loudspeaker's mute and solo capability. Meyer Sound currently ships RMS-equipped loudspeakers with the Mute Jumper installed. These mute-enabled loudspeakers can be identified by the blue "ME" sticker on the face of the RMS module. Older RMS-equipped loudspeakers can easily be mute-enabled by installing the Mute Jumper. For more information, see "Installing the Mute Jumper" on page 15.

ABOUT THE RMS MODULE

The RMS user panel has three LEDs, two buttons, and two Network connectors.



RMS Module

NOTE: The LEDs and buttons on the RMS user panel are used exclusively by RMS and have no effect on the acoustical or electrical activity of the loudspeaker.

Service LED (Red)

The red Service LED provides the following feedback:

- When unlit, the loudspeaker is successfully connected to the network and commissioned.
- When blinking once every two seconds, the loudspeaker is connected to the network but not yet commissioned in the RMS software.
- When lit continuously, the loudspeaker's RMS hardware has failed and may indicate that the module has been damaged (contact Meyer Sound Technical Support).

Service Button

Pressing the Service button identifies the loudspeaker on the RMS network and notifies the RMS software that the loudspeaker is connected. You can simultaneously press the Reset and Service buttons to reset the RMS module and decommission the loudspeaker from the network (see "Resetting the RMS Module" on page 10).

Wink LED (Green)

The green Wink LED lights when a signal is sent from the RMS software by clicking the Wink button on the loudspeaker's icon or on its Text view. This is useful for identifying the physical loudspeaker corresponding to a loudspeaker icon in the RMS software.

Reset Button

Pressing the Reset button causes the RMS module's firmware to reboot; this will not affect whether the loudspeaker is commissioned (which is stored in flash memory). You can simultaneously press the Reset and Service buttons to reset the RMS module and decommission the loudspeaker from the network (see "Resetting the RMS Module" on page 10).

Activity LED (Green)

The green Activity LED flashes continuously when the loudspeaker has been successfully commissioned.

Network Connectors

The two bi-directional Weidmuller locking connectors transfer data to and from the RMS network. Two connectors are provided to allow for easy connection of multiple (daisy-chained) loudspeakers on the network.

RESETTING THE RMS MODULE

You can use the Reset and Service buttons to reset the RMS module, which will cause the module to be decommissioned from the network.

To reset the RMS module:

1. Press and hold the Service button for 10 seconds.
2. While continuing to hold down the Service button, press and hold the Reset button for 5 seconds.
3. After releasing the Reset button, continue holding down the Service button for 5 seconds. The RMS module is reset and the loudspeaker is decommissioned. The RMS module's red Service LED blinks.

INSTALLING THE RMS MODULE (ULTRASERIES LOUDSPEAKERS)

This section documents installing the RMS module in UltraSeries loudspeakers. The same procedure can also be used to install or replace an RMS module in several of the M-Series loudspeakers (see Table 1). This installation procedure requires a standard #2 Phillips screwdriver.

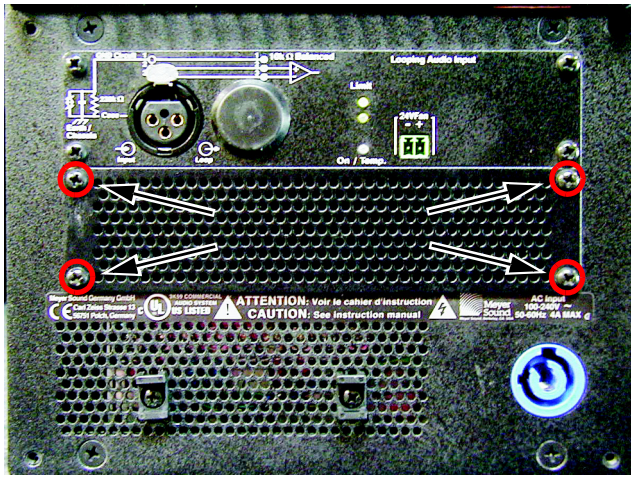
Table 1: UltraSeries RMS Modules

RMS Module	Series	Loudspeakers
PN 40.076.029.01	M-Series	M2D
	UltraSeries	UPA-1P, UPA-2P, UM-1P, UM-100P, USM-1P, USM-100, USW-1P
PN 40.084.008.01	M-Series	M1D, MD1-Sub, M'elodie
	UltraSeries	MJF-212, MJF-212A, UMS-1P, UPJ-1P, UPJunior, UPM-1P, UPM-2P, UPQ-1P, UPQ-2P

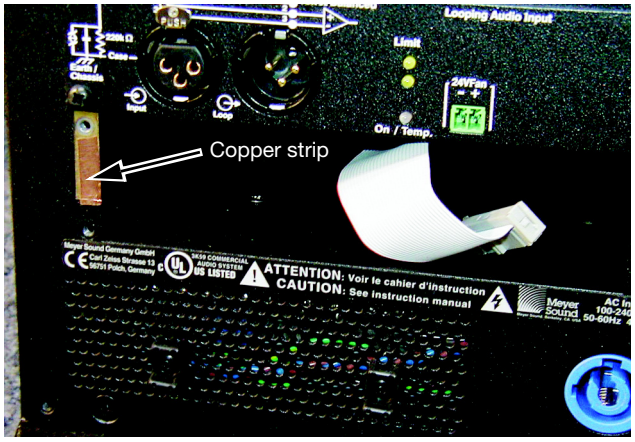
NOTE: If you want to enable muting capability for the loudspeaker, make sure to install the Mute Jumper on the RMS module before installing it. For more information, see "Installing the Mute Jumper" on page 15.

To install an RMS module in an UltraSeries loudspeaker:

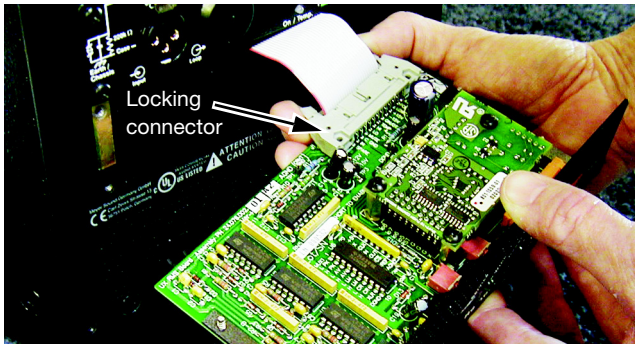
1. Remove the loudspeaker's AC power cable and audio cable and place the loudspeaker on a clean, low-static flat surface. Orient the loudspeaker with the top facing up.
2. Remove the four screws securing the cover plate for the slot below the audio input module. Save the cover plate in case you need it in the future.



3. Verify that the copper strip on the left side of the open slot is not damaged and properly positioned. The copper strip helps ground the RMS module to the chassis. If you need to replace the copper strip, contact Meyer Sound.



4. Locate the ribbon cable beneath the audio input module and attach this cable to the connector on the RMS module. Make sure to fully lock the connector.



NOTE: Make sure to hold the RMS module by its edges. Avoid touching any of the components on the RMS module.

5. Slide the RMS module into the open slot (below the audio input module) and secure it with the four screws.
6. Reconnect the loudspeaker's AC power cable and audio cable and apply power to the loudspeaker. The Activity LED blinks to indicate the RMS module is operational and ready to be commissioned on the network.

INSTALLING THE RMS MODULE (MP AND HP AMPLIFIER LOUDSPEAKERS)

This section documents installing the RMS module in loudspeakers with an MP-2, MP-4, HP-2, and HP-4 amplifiers. These loudspeakers are all compatible with the same RMS module (see Table 2).

Table 2: MP/HP Amplifier RMS Module

RMS Module	Series	Loudspeakers
PN 40.033.071.01	M-Series	M2D-Sub, M3D, M3D-Sub, MICA, MILO 60, MILO 120
	Concert Series	600-HP, 700-HP, 650-P, DF-4, DS-2P, DS-4P, MSL-4, MSL-6, MTS-4, PSM-2, PSW-2, PSW-4, PSW-6,
	Industrial Series	SB-1, SB-2, SB-3F

This installation procedure requires the following:

- Standard #2 Phillips screwdriver
- 3/8" nut driver
- Fluke 87 multimeter or equivalent ohmmeter

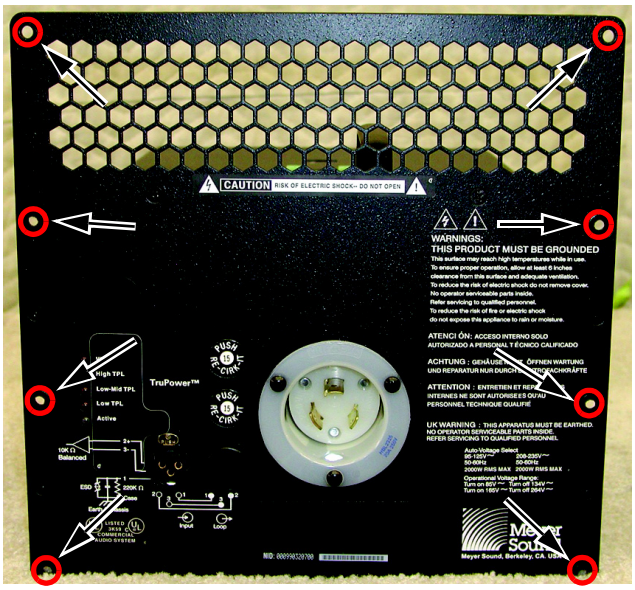
NOTE: If you want to enable muting capability for the loudspeaker, make sure to install the Mute Jumper on the RMS module before installing it. For more information, see "Installing the Mute Jumper" on page 15.

NOTE: Before adding an RMS module to loudspeakers with amplifiers manufactured before 1997, the loudspeakers must be retrofitted with TPL control boards and RMS-ready user panels.

To install an RMS module in a loudspeaker with an HP or MP amplifier:

1. Remove the loudspeaker's AC power cable and audio cable and place the loudspeaker on a clean, low-static firm surface. Orient the loudspeaker with the top facing up.
2. To remove the amplifier from the loudspeaker cabinet:

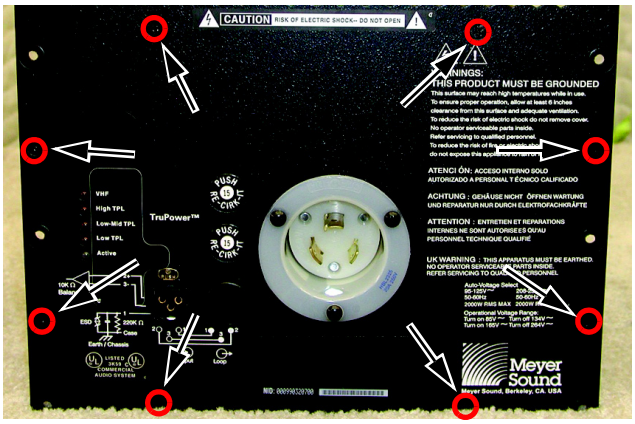
- Remove the eight large screws that secure the amplifier to the cabinet.



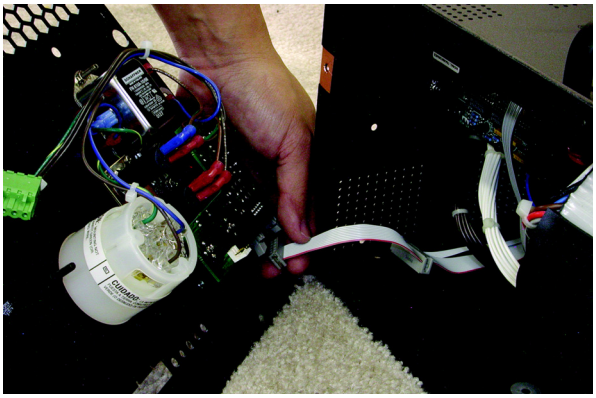
- Remove the amplifier from the cabinet slowly, taking care to unplug the green loudspeaker connector on the top side of the amplifier (there are two connectors for the four-channel amplifiers).
- Place the amplifier on a clean, low-static flat firm surface.

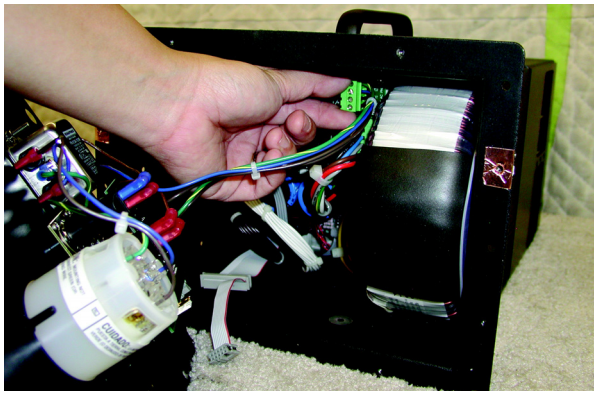
3. To remove the user panel from the amplifier:

- Remove the eight small screws from the user panel.

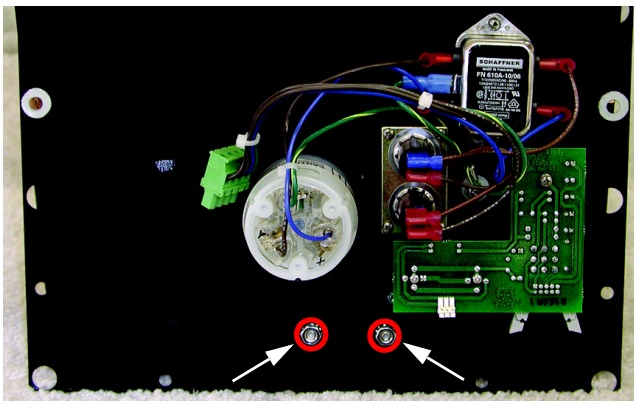


- While carefully removing the user panel, disconnect from the user panel the signal cable from the input board (with the gray connector), and disconnect from the AC mains board the AC input cable (4-wire, green connector) from the user panel.

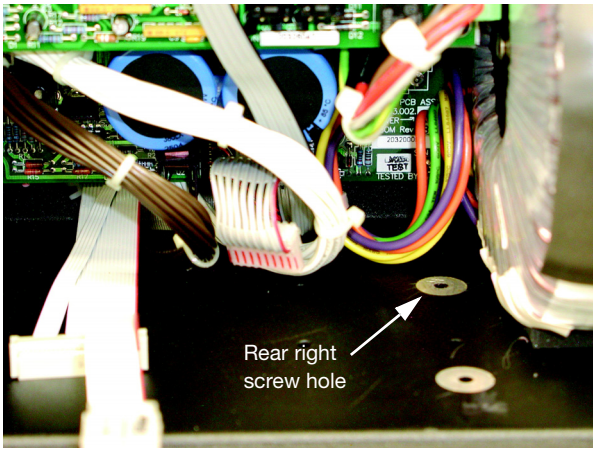




4. Remove the blank cover plate from the user panel by removing the two nuts on the back of the user panel.

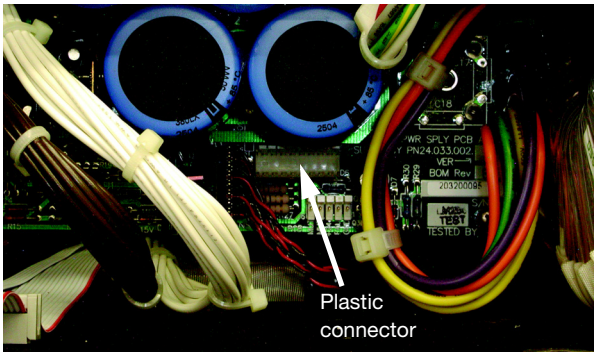


5. In the power supply chassis, locate the back right screw hole (next to the transformer) on the floor of the chassis. If the paint around the hole has not been sufficiently removed (to allow for metal-to-metal contact with the module standoff), remove the paint with a Dremel tool or sandpaper. Make sure to remove all debris from the chassis before proceeding.

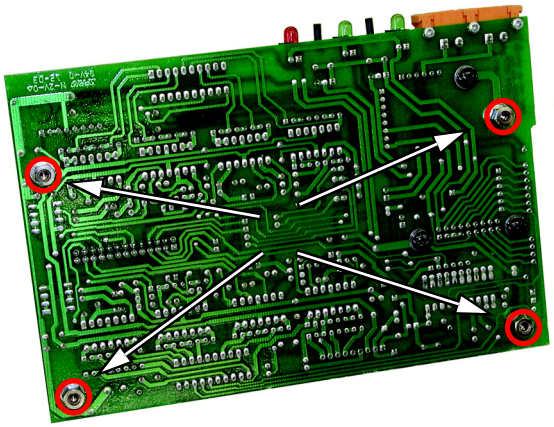


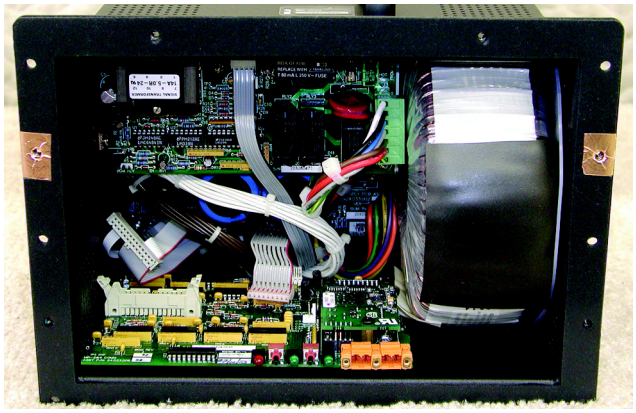
⚠ **CAUTION:** Do not grind down the metal around the screw hole too much. If the metal is too thin it will reduce the metal-to-metal contact (and grounding) with the RMS module.

6. Remove the plastic connector on the power supply board (next to the fan power connector).



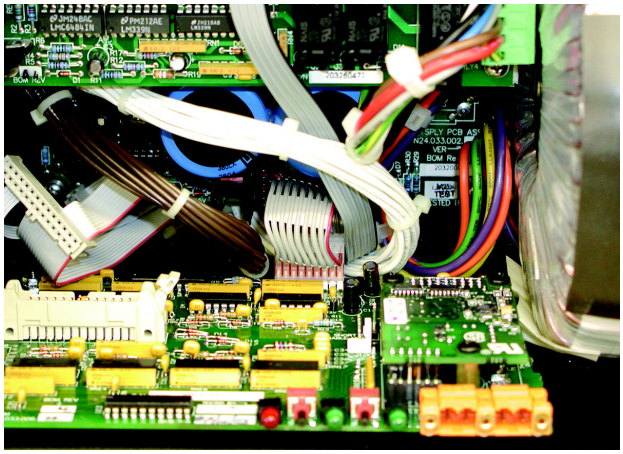
7. Apply one drop of Loctite® to each of the four standoffs on the RMS module and then place the module in the bottom of the power supply chassis with the LEDs facing out and the standoffs aligned with the four screw holes in the bottom of the chassis.



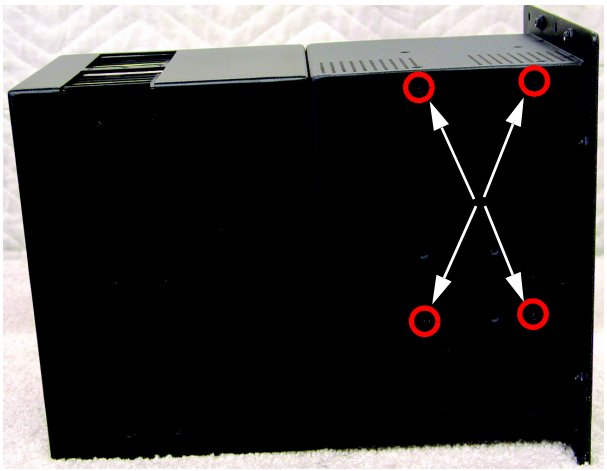


NOTE: Make sure to hold the RMS module by its edges. Avoid touching any of the components on the RMS module.

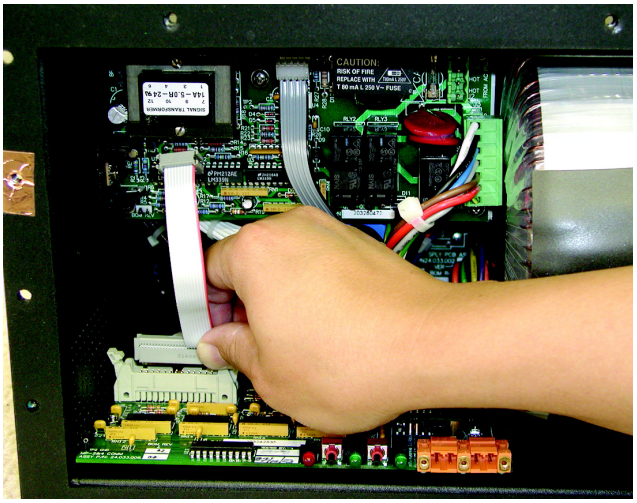
8. Attach the short 9-wire gray ribbon cable from the RMS module to the connector on the power supply board. Make sure all pins are engaged and that the connector is firmly seated.



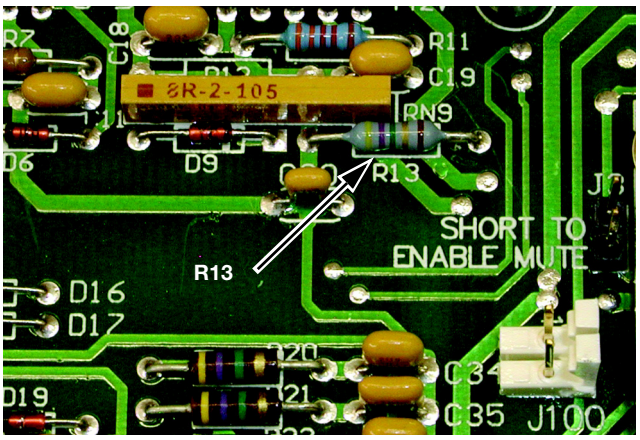
9. While holding the RMS module in place, place the loudspeaker on its side and secure the RMS module using the four screws included with the kit.



10. Attach the 26-pin connector from the long ribbon cable to the RMS module connector. Make sure to fully lock the connector.



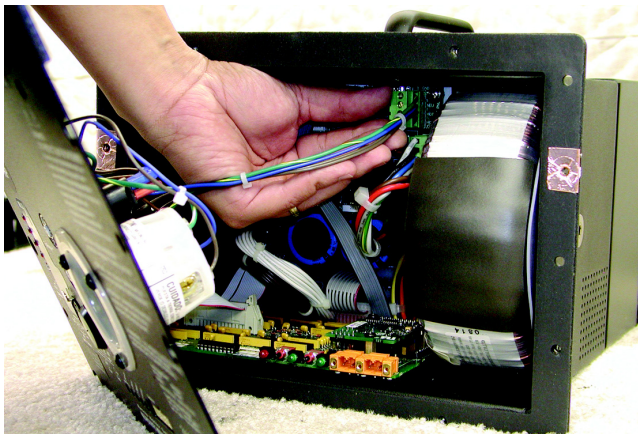
11. Using an ohmmeter, measure the resistance for R13 on the RMS module. R13 is located about an inch to the right of the center of the module. The resistance should measure 10 ohms. If the resistance measures 47 ohms, the module is insufficiently grounded.



NOTE: Insufficient grounding may be caused by too much paint surrounding the back right screw hole (see Step 5), or it may be caused by over-thinning the screw hole (if this is the case, a shorter screw may fix the problem).

NOTE: The resistance for R13 will not read 10 ohms if the ribbon cable from the RMS module was not connected to the power supply board (see Step 8).

12. Reconnect the AC input cable (4-wire, green connector) from the user panel to the AC mains board. Reconnect the signal cable from the input board (gray multipin connector) to the user panel. Make sure to fully lock the gray multipin connector.



13. While carefully aligning the RMS module's network connectors and LEDs with the user panel, secure the user panel to the amplifier with the eight small screws.
14. Reconnect the green connector from the loudspeaker cabinet to the top of the amplifier (there are two connectors for the four-channel amplifiers), then carefully slide the amplifier back in the cabinet and secure it with the eight large screws.
15. Affix the Neuron ID label to the bottom center of the user panel, directly below the RMS module's LEDs and network connectors.

Neuron ID label

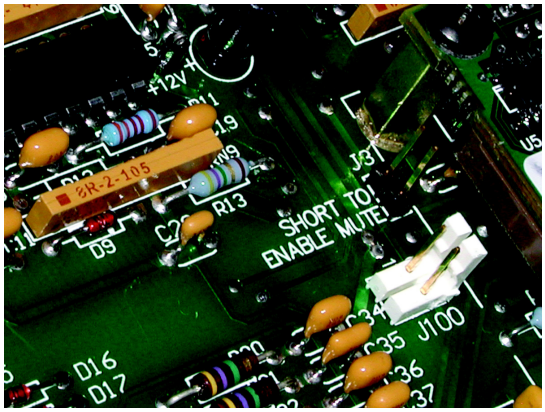
16. Reconnect the loudspeaker's AC power cable and audio cable and apply power to the loudspeaker. The Activity LED blinks to indicate the RMS module is operational and ready to be commissioned on the network.

INSTALLING THE MUTE JUMPER

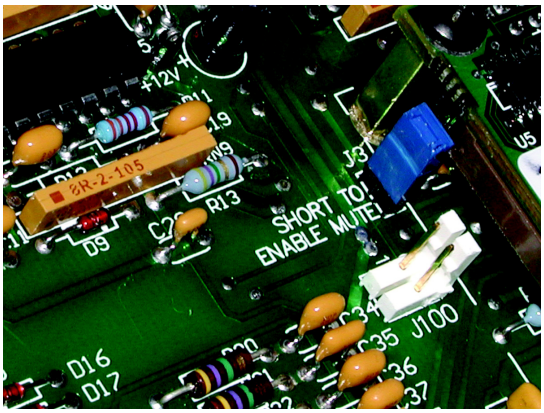
To use the mute and solo functions of any RMS-equipped Meyer Sound loudspeaker, the Mute Jumper must be installed on the RMS module. Meyer Sound currently ships RMS-equipped loudspeakers with the Mute Jumper installed. These mute-enabled loudspeakers can be identified by the blue “ME” sticker on the face of the RMS module. Older RMS-equipped loudspeakers can easily be mute-enabled by installing the Mute Jumper.

To install the Mute Jumper:

1. Remove the loudspeaker’s AC power cable and then wait at least five minutes before removing the RMS module.
2. On the RMS module, locate the two jumper pins labeled SHORT TO ENABLE MUTE and install the blue Mute Jumper on these two pins.



Mute Jumper Not Installed



Mute Jumper Installed

⚠ **CAUTION:** Do not mistakenly install the Mute Jumper on the white, unlabeled two-pin connector on the RMS module. This connector is for the VEAM connector option; using it for any other purpose will damage the RMS module.

3. Reinstall the RMS module in the loudspeaker.

CHAPTER 3: INSTALLING THE RMS SOFTWARE

The RMS software includes the RMS program, Echelon interface drivers, and LSN server software. This chapter documents installation of the RMS software and includes the following topics:

- "Backing Up RMS Files" on page 17
- "Installing the RMS Software" on page 17
- "About the RMS Serial Number" on page 18

CAUTION: Do not attempt to install your network interface until after you have installed the RMS software. The RMS Setup program installs the required Echelon drivers for the network interfaces. Make sure to only use the Echelon drivers included with the RMS software; they have been tested and verified to work optimally with RMS systems.

BACKING UP RMS FILES

If you are upgrading to a new version of the RMS software and want to use your existing RMS configuration, you should back up your RMS files before installing the new software. After installation, you can then import the RMS database (see "Importing RMS Network Databases" on page 38) and load the desired panel files. While the RMS Setup program automatically backs up existing databases (adding a date and time stamp to the folder name), it does not back up RMS panel files. To be safe, you should manually back up your RMS files on a regular basis.

TIP: Make sure to regularly back your RMS files (perhaps once a week). If you lose these files because of a hard drive failure and do not have a backup, you will have to rebuild and recommission your entire RMS configuration.

To back up RMS files:

1. In Windows Explorer, navigate to the **C:\meyer\rms** folder on your hard drive.
2. Copy the following items to another location on your hard drive, or onto a backup disc or other storage media.

- Any panel files with a .pnl extension
- Any folders named RMSNET, including those with numerals (RMSNET1, RMSNET2, etc.)

RMSNET folders contain network databases associated with an Echelon network interface card, while numbered RMSNET folders contain network databases associated with an i.LON 10 ethernet adapter.

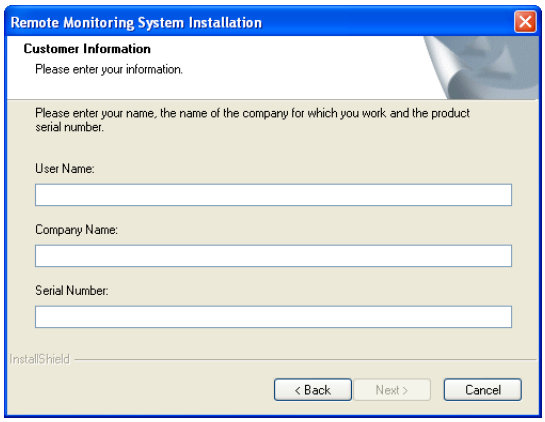
CAUTION: Do not copy or remove the RMSNET_INT folder.

INSTALLING THE RMS SOFTWARE

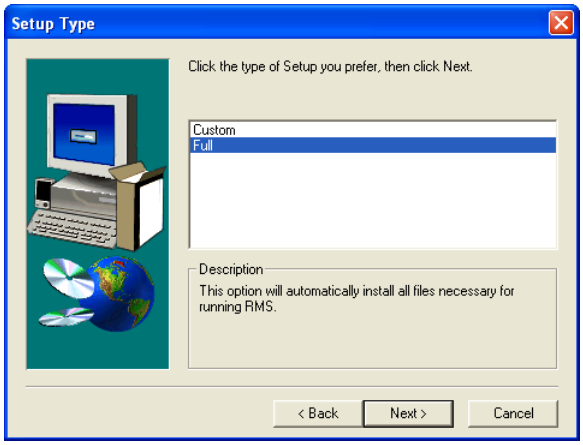
NOTE: If you are upgrading your RMS software, it is not necessary to uninstall it before installing the new RMS software. The RMS Setup program automatically removes the earlier RMS software components.

To install the RMS software:

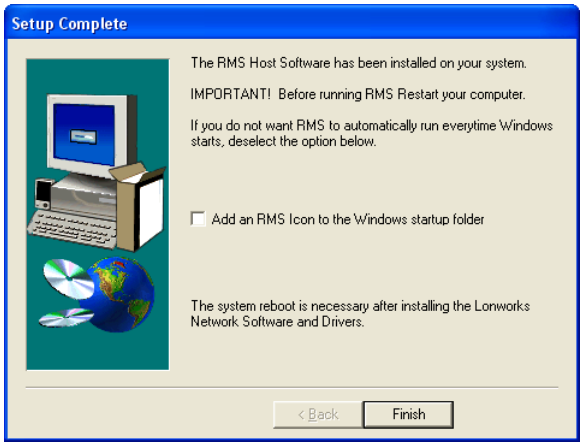
1. Insert the RMS Installation disc in your computer. If the **Setup** program does not automatically launch, locate it in Windows Explorer and double-click it.
2. In the User Information dialog box, enter your **User Name**, **Company Name**, and **Serial Number**. The serial number is located on the RMS Installation disc sleeve; enter it exactly as it appears, including any hyphens. Click **Next**.


Remote Monitoring System Installation
Customer Information
Please enter your information.
Please enter your name, the name of the company for which you work and the product serial number.
User Name:
Company Name:
Serial Number:
InstallShield
< Back
Next >
Cancel

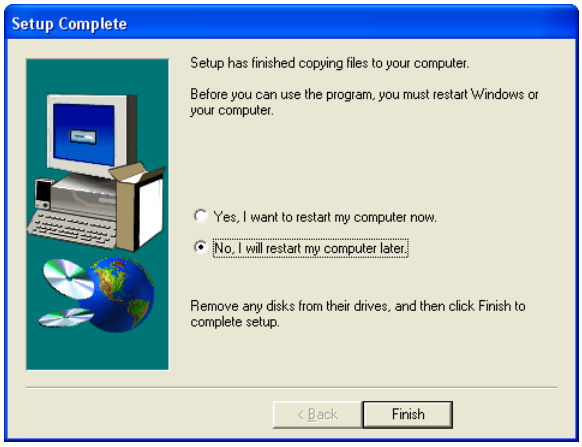
3. In the Setup Type dialog box, select the option for **Full** installation and click **Next**.



4. In the Setup Complete dialog box, deselect **Add an RMS icon to the Windows startup folder**. You should only select this option if you want RMS to launch automatically when Windows starts up. Click **Finish**.


Setup Complete
The RMS Host Software has been installed on your system.
IMPORTANT! Before running RMS Restart your computer.
If you do not want RMS to automatically run everytime Windows starts, deselect the option below.
Add an RMS Icon to the Windows startup folder
The system reboot is necessary after installing the Lonworks Network Software and Drivers.
< Back
Finish

5. When prompted to restart Windows, select "Yes, I want to restart my computer now" and click **Finish**.


Setup Complete
Setup has finished copying files to your computer.
Before you can use the program, you must restart Windows or your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
< Back
Finish

ABOUT THE RMS SERIAL NUMBER

Your 16-digit RMS serial number is located on the RMS Installation disc sleeve. It must be entered (with the hyphens) when running the RMS Setup program. After installation, your RMS serial number can be viewed in the RMS program by choosing **About > About RMS**. The serial number can also be viewed by launching the **rms.ini** file located in the WINDOWS folder.

It is recommended that you write down your RMS serial number in a safe place as a backup. A space is provided for the serial number on the inside cover of this guide.

CHAPTER 4: INSTALLING AND CONFIGURING NETWORK INTERFACES

This chapter documents installing and configuring RMS-compatible network interfaces and Ethernet adapters and includes the following topics:

- "Network Interface Cards" on page 19
- "The U10 USB Network Interface Adapter" on page 20
- "The i.LON 10 Ethernet Adapter" on page 21

Before proceeding, make sure you have already installed the RMS software, which includes the required drivers for the network interfaces and Ethernet adapters. For more information, see Chapter 3, "Installing the RMS Software."

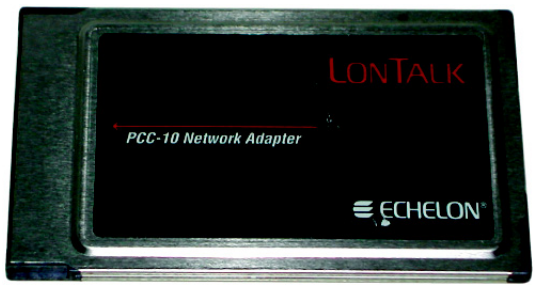
NETWORK INTERFACE CARDS

RMS supports the following network interface cards for interfacing to RMS-equipped loudspeakers:

- LonWorks PCLTA-20/PCLTA-21 PCI Network Interface cards

LonWorks PCLTA-21 PCI Network Interface Card

- LonWorks PCC-10 PC Network Interface card



LonWorks PCC-10 PC Network Interface Card

NOTE: RMS also supports the LonWorks U10 USB Network Interface Adapter for USB-enabled computers. For more information, see "The U10 USB Network Interface Adapter" on page 20.

Installing Network Interface Cards

To install a network interface card:

1. Power down your computer and install one of the following network interface cards:

- If you have a LonWorks PCLTA-21 Network Interface card, install it in any 3.3 V, 5 V, 32-bit, 64-bi, PCI or PCI-X slot, according to the manufacturer's instructions. For more information, refer to the *LonWorks PCLTA-21 User Guide*.
- If you have a LonWorks PCLTA-20 Network Interface card, install it in a 32-bit PCI card slot, according to the manufacture's instructions. For more information, refer to the *LonWorks PCLTA-20 User Guide*.
- If you have a LonWorks PCC-10 Network Interface card, install it in a Type II PC card (PCMCIA) slot, according to the manufacture's instructions. For more information, refer to the *LonWorks PCC-10 User Guide*.

2. Power up your computer and launch Windows.

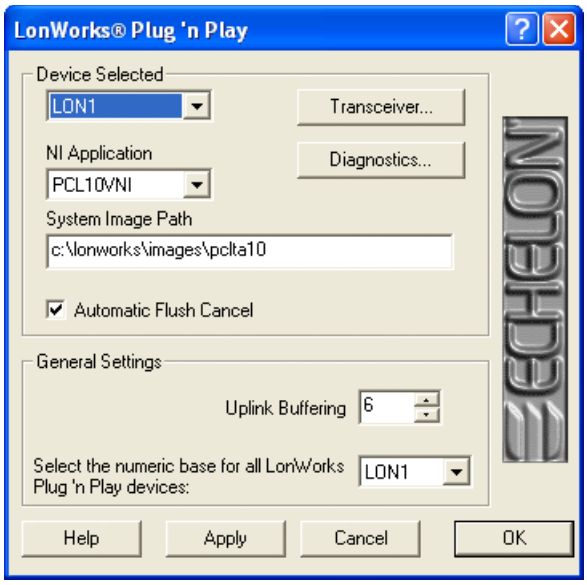
Validating Network Interface Cards

After installing the RMS software and inserting the network interface card, you must then launch the LonWorks Plug'n Play control panel to validate the card.

To validate the network interface:

1. From the Windows taskbar, choose **Start > Control Panel**.
2. In the Control Panel window, open the **LonWorks Plug'n Play** control panel.

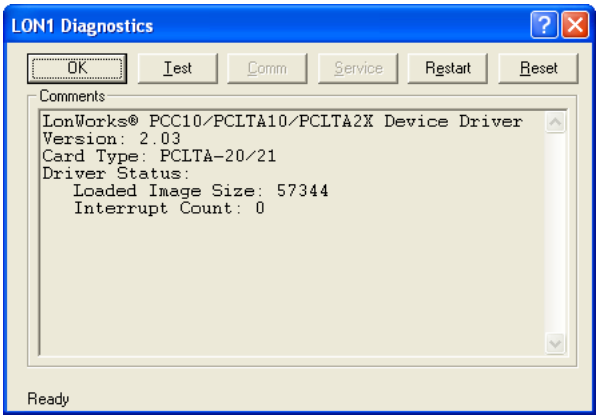
3. Set the **NI Application** to one of the following options, depending on your network interface:



PCLTA21VNI	Desktop computers with a PCLTA-21
PCL10VNI	Desktop computers with a PCLTA-20
PCC10VNI	Laptop computers with a PCC-10

4. Click **Apply** to initialize the network interface card.
5. To test the network interface card, do the following:

- Click **Diagnostics**.
- In the Diagnostics dialog box, click **Test**. The connection status of the card is tested and the results are displayed. The results should be similar to those in the following figure.



NOTE: If you encounter any error messages, click **Restart** and **Reset** to reset the card and reload its firmware, then click **Test** again.

- Click **OK** to close the Diagnostics dialog box.

6. Click **OK** to close the LonWorks Plug'n Play control panel.

TIP: You can use the LonWorks Plug'n Play control panel at any time to verify whether the network interface card is properly installed and configured.

THE U10 USB NETWORK INTERFACE ADAPTER

The LonWorks U10 USB Network Interface Adapter attaches to your computer's USB port and includes an adapter cable for connecting to the RMS network with a Weidmuller connector.

LonWorks U10 USB Network Interface Adapter

NOTE: If you are using the U10 USB Network Interface Adapter with a laptop computer and the laptop already has a LonWorks network interface card installed, the card must be uninstalled before attaching the U10 adapter.

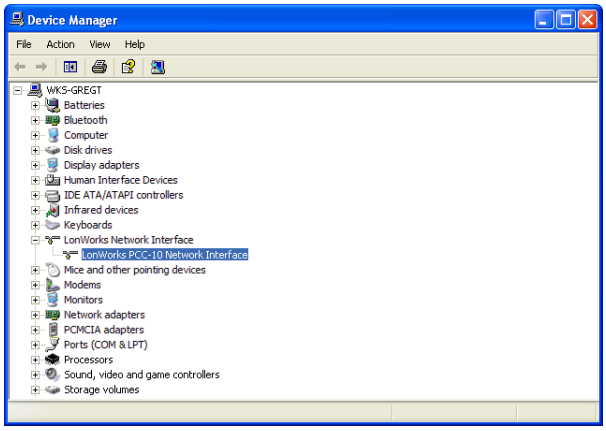
Installing the U10 USB Network Interface Adapter

To install the LonWorks U10 USB Network Interface Adapter:

1. If you have a LonWorks network interface card installed, uninstall it:

- From the Windows taskbar, choose **Start > Control Panel**.
- In the Control Panel window, open the **System** control panel and click the **Hardware** tab, then click **Device Manager**.

- In the Device Manager window, in the device list, select the LonWorks network interface card and choose **Action > Uninstall**. When prompted to confirm the device removal, click **OK**.

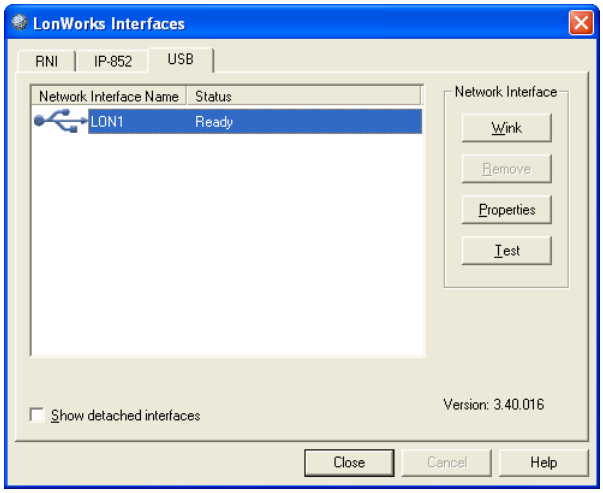


- Power down your computer and remove the LonWorks network interface card from your computer following the manufacturer's instructions, then power up your computer and log into Windows.
- From the Windows taskbar, choose **Start > Control Panel**.
- In the Control Panel window, open the **LonWorks Plug'n Play** control panel. The control panel opens with Device Selected set to **None**. Click **Cancel** to close the LonWorks Plug'n Play control panel.

  ⚠ **CAUTION:** This step must be performed. Opening and closing the LonWorks Plug'n Play control panel allows the Echelon driver to detect that the card is no longer installed.

2. Attach the U10 adapter to your computer's USB port according to the manufacturer's instructions. For information, refer to the *LonWorks U10 USB User Guide*.

3. Open **LonWorks Interfaces** control panel. Click the **USB** tab and verify that the U10 appears as **LON1**.



4. Click **Close** to close the LonWorks Interfaces control panel.

THE I.LON 10 ETHERNET ADAPTER

The i.LON 10 Ethernet Adapter converts twisted-pair networks to Ethernet 10Base-T, allowing you to connect RMS networks to a computer using a standard Ethernet network. Multiple i.LON 10 Ethernet Adapters can be connected to a single computer (via a hub or switch) to make a larger RMS network with sub-networks, which is especially useful for operating over long distances with large numbers of loudspeakers.

LonWorks i.LON 10 Ethernet Adapter

For systems with multiple i.LON 10s, each i.LON 10 must have its own static IP address to distinguish it as a separate segment on the RMS network. Each unit will also have its own RMS database containing a list of the loudspeakers on that segment.

NOTE: RMS also supports the LonWorks i.LON 100 Ethernet Adapter, which can be configured for external muting of RMS loudspeakers when a fire alarm or external relay is triggered. For more information, see Appendix C, "External Muting with the i.Lon 100."

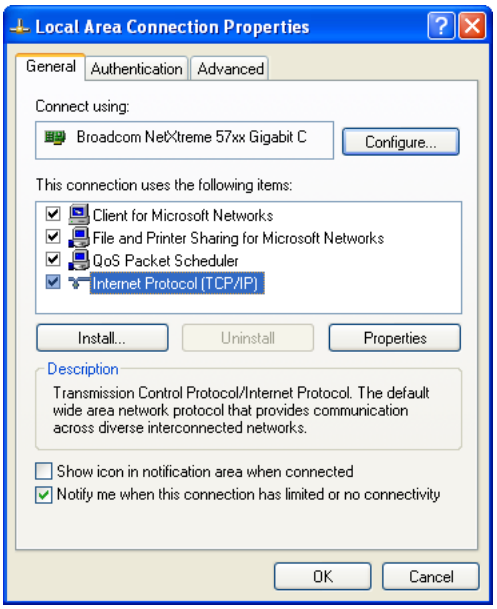
Installing the i.LON 10 Ethernet Adapter

To install the i.LON 10 Ethernet Adapter:

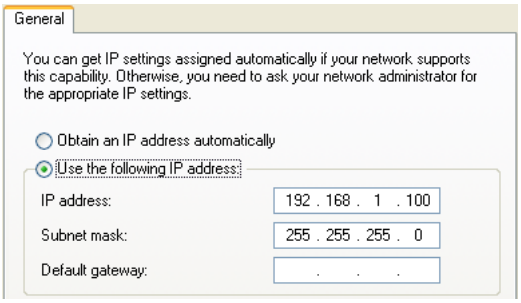
1. Use a Cat 5 crossover cable to connect the i.LON 10 to a computer Ethernet port, or to an Ethernet hub, switch, or router, according to the manufacturer's instructions. For more information, refer to the *LonWorks i.LON 10 User Guide*.
2. Configure your computer's IP address:

■ If you are using Windows XP, do the following:

- From the Windows taskbar, choose **Start > Control Panel**.
- In the Control Panel window, open the **Network Connections** control panel and then double-click **Local Area Connections**.
- In the Local Area Connection Status dialog box, click **Properties**.
- In the Local Area Connection Properties dialog box, on the General tab, select **Internet Protocol (TCP/IP)** and click **Properties**.



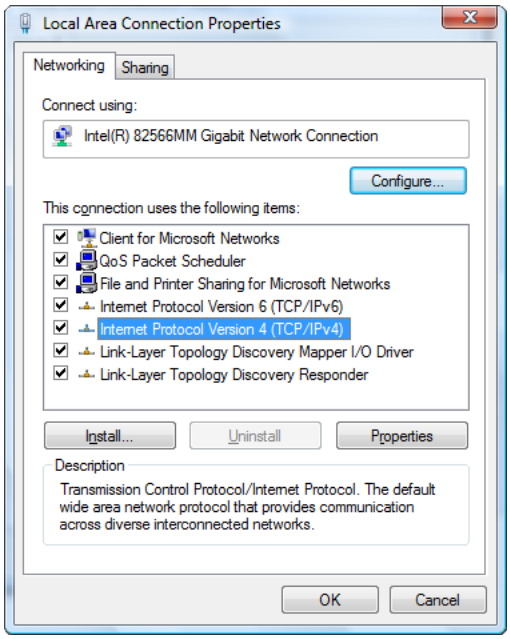
- In the Internet Protocol (TCP/IP) Properties dialog box, select "Use the Following IP Address" and enter 192.168.1.100 in the **IP Address field**, Accept the default Subnet Mask value. Click **OK**.


General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
192 . 168 . 1 . 100
Subnet mask:
255 . 255 . 255 . 0
Default gateway:

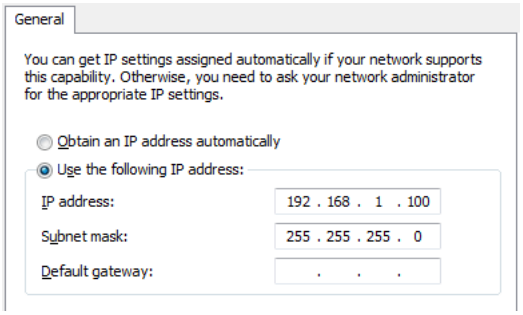
■ If you are using Windows Vista, do the following:

- From the Windows taskbar, choose **Start > Control Panel**.
- In the Control Panel window, open the **Network and Sharing Center** control panel and then click **Mange Network Connections**.
- In the Network Connections dialog box, right-click **Local Area Connection** and choose **Properties**.

– In the Local Area Connection Properties dialog box, on the Networking tab, select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**.



– In the Internet Protocol Version 4 (TCP/IPv4) Properties dialog box, select "Use the Following IP Address" and enter 192.168.1.100 in the **IP Address field**. Accept the default Subnet Mask value. Click **OK**.


General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address: 192 . 168 . 1 . 100
Subnet mask: 255 . 255 . 255 . 0
Default gateway:

3. Open the following link in your Web browser:

   http://192.168.1.222/config

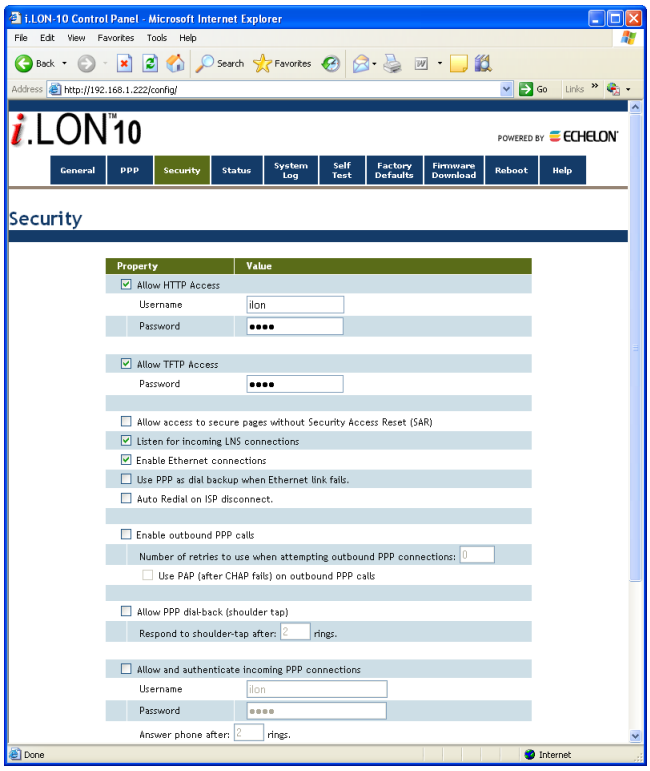
4. When prompted to log in, enter the following User Name and Password and click **OK**.

   User Name: ilon

   Password: ilon

5. Click the **Security** tab. On the Security page, select the options for **Allow HTTP Access** and **Allow TFTP Access**.

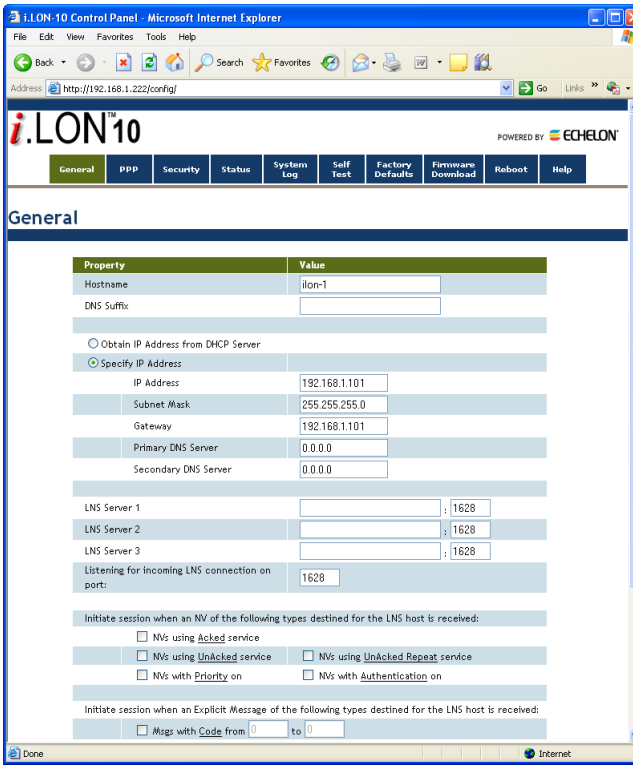
   CAUTION: Do not yet click **Submit**.



6. Click the **General** tab. On the General page, in the Hostname field, enter **ilon-1** (with no spaces). Additional i.LON 10s on the same network should be named sequentially (ilon-2, ilon-3, ilon-4, and so forth).

   CAUTION: Do not use any other naming scheme for the i.LON 10s. They must be named as indicated.

7. Select **Specify IP Address** and in the IP Address field enter **192.168.1.101**. IP addresses for additional i.LON 10s on the same network must be assigned sequentially (192.168.1.102, 192.168.1.103, 192.168.1.104, and so forth).



8. Click **Submit**.

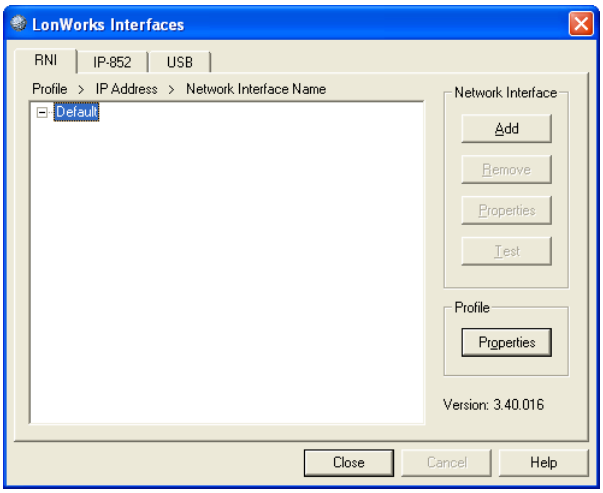
Make sure to document the IP addresses for your computer and each i.LON 10 on the network, as well as the name for each i.LON 10. To distinguish the i.LON 10s on the network, you should physically label each with its name and IP address.

NOTE: If you encounter problems when configuring the i.LON 10, it may be necessary to perform a security reset. This is done by holding down the i.LON 10's Service Pin while turning on the unit; continue holding down the Service Pin until the Wink and Connect LEDs light (this may take around 10 seconds). The i.LON 10 is restored to its default IP address (192.168.1.122).

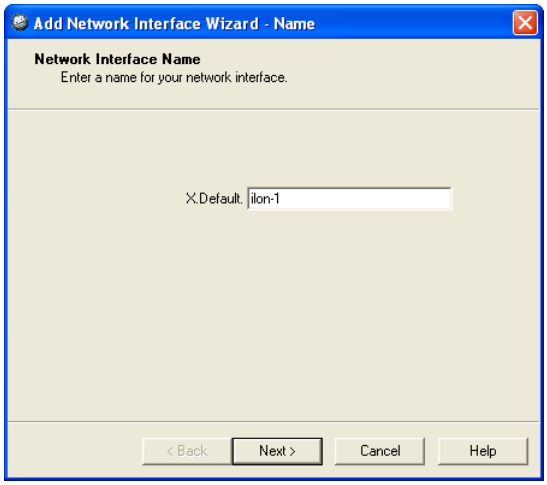
Configuring the LonWorks Interfaces Control Panel

To configure the LonWorks Interfaces control panel:

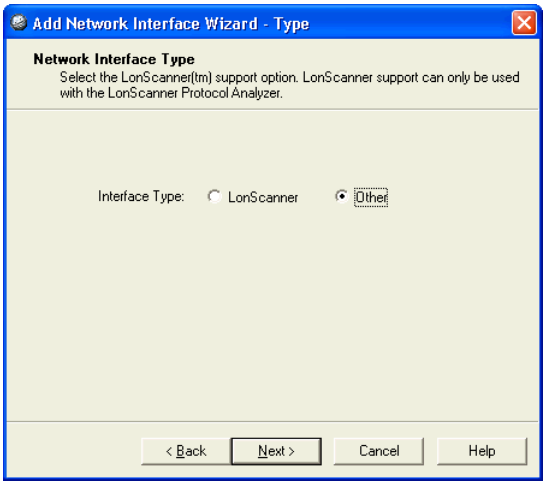
1. From the Windows taskbar, choose **Start > Control Panel**.
2. In the Control Panel window, open the **LonWorks Plug'n Play** control panel.
3. On the RNI tab, click **Add**.



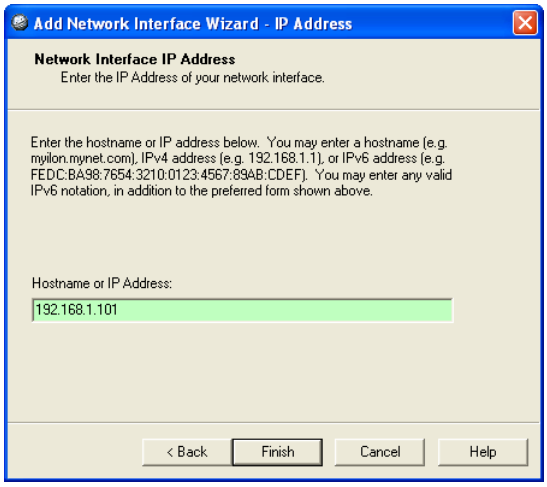
4. On the Add Network Interface Wizard – Name page, enter the Name for the i.LON 10 and click **Next**. The name must match the Hostname entered in "Installing the i.LON 10 Ethernet Adapter" on page 22.



5. On the Add Network Interface Wizard – Type page, set the Interface Type to Other and click **Next**.



6. On the Add Network Interface Wizard – IP Address page, enter the IP Address and click **Finish**. The address must match the IP Address entered in “Installing the i.LON 10 Ethernet Adapter” on page 22.


Add Network Interface Wizard - IP Address
Network Interface IP Address
Enter the IP Address of your network interface.
Enter the hostname or IP address below. You may enter a hostname (e.g. myilon.mynet.com), IPv4 address (e.g. 192.168.1.1), or IPv6 address (e.g. FEDC:BA98:7654:3210:0123:4567:89AB:CDEF). You may enter any valid IPv6 notation, in addition to the preferred form shown above.
Hostname or IP Address:
192.168.1.101
< Back
Finish
Cancel
Help

7. Repeat the previous steps to add additional i.LON 10s. The name and address must follow the scheme used in “Installing the i.LON 10 Ethernet Adapter” on page 22 (ilon-1, 192.168.1.101; ilon-2, 192.168.1.102; ilon-3, 192.168.1.103; and so forth).

CHAPTER 5: CONNECTING RMS NETWORKS

This chapter documents connecting RMS networks and includes the following topics:

- "Twisted-Pair vs. Ethernet" on page 27
- "Twisted-Pair Cabling" on page 27
- "Ethernet Hubs and Switches" on page 28
- "Design Tips for RMS networks" on page 29
- "Network Specifications" on page 29
- "Twisted-Pair Configurations" on page 30
- "Ethernet Configurations" on page 33

TWISTED-PAIR VS. ETHERNET

RMS networks can connect to the host computer via either twisted-pair cabling or Ethernet. Basic twisted-pair connections with a network interface card are suitable for most applications. They are easy to wire and connect and they require no additional networking hardware, such as routers, switches, or hubs (although a network repeater is required for cable runs longer than 1640 ft). Ethernet-based connections with one or more i.LON 10s allow for a larger number of loudspeakers on a single network, a wider area of available locations, and improved network speed.

When deciding which technology to use, consider:

- The number of required loudspeakers on the network
- The amount of cabling needed for the network
- Whether the system will be fixed or portable
- The distance between the host computer and the loudspeakers on the network
- Whether there is any existing Ethernet network access at the venue

Regardless of whether you use twisted-pair or Ethernet connections, avoid overloading the network by adhering to the following guidelines:

- Do not connect more than 50 loudspeakers on a single network segment. A network segment is equivalent to one network interface card (without a network repeater), or a single i.LON 10 Ethernet Adapter.
- The total length of twisted-pair cabling per network segment should not exceed 1640 ft (500 m). For systems with network repeaters, the distance to the first loudspeaker should also not exceed 1640 ft (500 m).

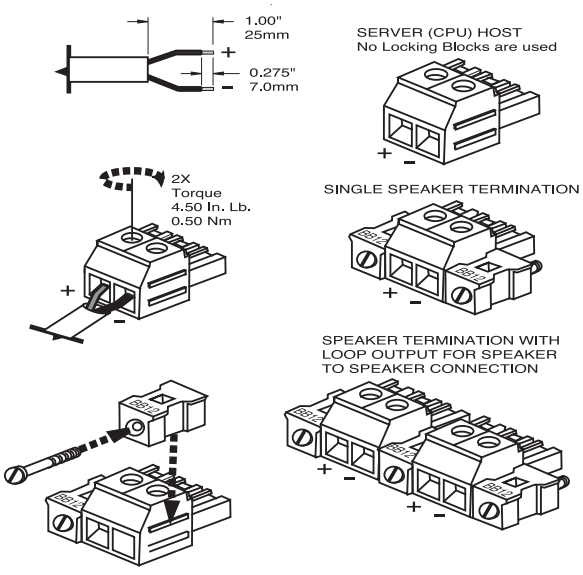
NOTE: For optimum performance, the twisted-pair cabling between the host computer and first loudspeaker should not exceed 1,450 ft (450 m).

The RMS software and hardware components interact continuously, communicating information about the connected loudspeakers to the host computer. If the network is overloaded, critical data may reach the host computer very slowly, or not at all.

CAUTION: Meyer Sound recommends that Ethernet-based RMS configurations be deployed as a closed network, to reduce congestion from outside network activity.

TWISTED-PAIR CABLING

The Weidmuller Network connectors on RMS modules are connected via twisted-pair cables. The twisted-pair cabling can be connected directly to any of the computer-based network interfaces (LonWorks PCLTA-21, PCLTA-20, PCC-10, U10 USB, and i.LON 10).



Twisted-pair connectors for RMS loudspeakers

For twisted-pair cabling, the following limitations apply:

- Maximum number of loudspeakers: 50
- Maximum length of total cabling: 1640 ft (500 m)

To reduce the amount of twisted-pair cabling in an RMS network, groups of neighboring loudspeakers can be daisy-chained. In addition, the single, twisted-pair cable connected directly to the computer network interface can be spliced at a junction box or breakout panel with multiple outputs that can be patched to multiple loudspeaker destinations.

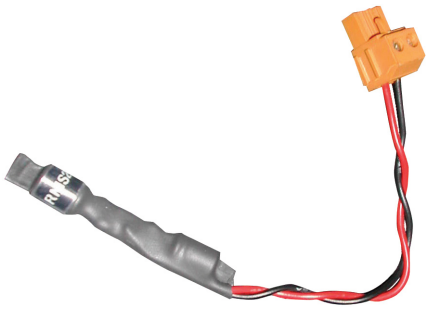
NOTE: A network repeater or an Ethernet-based system with multiple i.LON 10s is required if you want to connect more than 50 loudspeakers to an RMS host computer. This will increase the data traffic capacity of the network as well as the signal strength over longer cable runs.

Custom Twisted-Pair Connectors

When designing twisted-pair cable runs, you can use custom connectors (such as 5-pin XLR connectors) or terminal blocks to make the installations more user-friendly. This is common for theater and touring applications.

Network Terminators

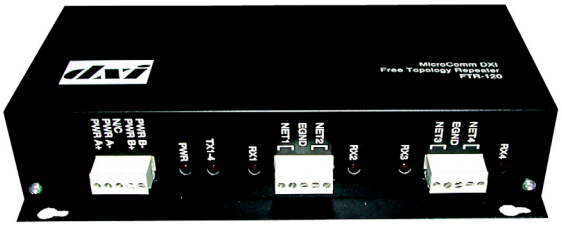
An RMS network terminator is a simple resistive, capacitive device designed to prevent electrical reflections on the network. Terminators can be installed at almost any location in the network depending on the topology used.



RMS Network Terminator

Network Repeaters

A network repeater (such as the FTR-120 Free Topology Repeater from MicroComm DXI) connects multiple segments of network cabling. It re-times, strengthens, and regenerates the signal and sends it back to the network. A network repeater allows you to increase the geographical coverage of an RMS network and can be used in applications where Ethernet connections are impractical, for example, when touring with twisted-pair RMS configurations.



FTR-120 Network Repeater

NOTE: For information on using the FTR-120 Free Topology Repeater, see Appendix D, “The FTR-120 Free Topology Repeater.”

ETHERNET HUBS AND SWITCHES

A hub is a device that joins multiple computers or other network devices to form a single network. Switches are similar to hubs but are more intelligent; they can inspect data as it is received, determine the source and destination of the data, and forward it appropriately. Switches conserve network bandwidth and offer better performance than hubs.

A hub or a switch is needed for RMS Ethernet networks that contain multiple i.LON 10s, or if you are sharing an existing Ethernet network connection.

DESIGN TIPS FOR RMS NETWORKS

Different designs have their own strengths and weaknesses. The following tips will help you make the most of your RMS network design:

- Avoid making “dedicated single runs” for each loudspeaker when designing a system. Make only a single twisted-pair run to loudspeaker locations or arrays when possible. Once you have reached the loudspeaker array location, daisy-chain or loop through all the loudspeakers in the array. This will help reduce cable load on the network.

  ⚠ **CAUTION:** If you must make dedicated twisted-pair runs to each loudspeaker (for example, when using VEAM connectors) do not exceed the total recommended cable length (1,640 ft), or plan on using a repeater to minimize data loss.

- Use a single twisted-pair run from the computer location to a breakout panel, which should be located as close as possible to the loudspeakers.
- If you are receiving poor data or experiencing other communications problems, use a terminator in the network to help increase network stability.
- When planning an Ethernet-based network, plan for the i.LON 10 location to be as close to the twisted-pair breakout location as possible.
- When using a venue’s existing Ethernet-based network, work with the venue’s IT department to reserve static IP addresses for the RMS network.
- When possible, use a closed Ethernet-based network to reduce congestion from outside network activity

NETWORK SPECIFICATIONS

Maximum Loudspeaker Nodes

- Twisted-pair: 50 (up to 100 with network repeater)
- Ethernet: 50 for each i.LON 10

Cable Type

- Twisted-pair: 20 AWG (Belden 8205 or equivalent) twisted pair, stranded, unshielded
- Ethernet: Category 5 (Cat 5) or higher specification

  NOTE: The maximum length for Ethernet cables is 328 ft (100 m). When connecting an i.LON 10 to an Ethernet hub or switch, use a straight-through (patch) cable. When connecting directly to a computer Ethernet port, use a crossover cable.

Connector Type

- Twisted pair: Weidmuller 2-conductor locking connector
- Ethernet: 10BASE-T, type RJ-45
- USB 2.0: USB plug
- Portable: XLR and EN3

Maximum Network Length (without Repeaters)

- Free topology: 500 m (1,640 ft) with 20 AWG, 18 AWG or 16 AWG cable and one 52.3-ohm type terminator
- Ethernet: 10BASE-T network limitations plus standard twisted pair limitations

Termination

- Free topology: One 52.3-ohm type terminator at any point
- Bus topology: Two 52.3-ohm type terminators (one on either end)

Network Platform

- Differential Manchester encoding; polarity insensitive, free topology

Transceiver

- EMI, complies with FCC Part 15, Class A; UL recognized; VDE, EMI compliant

Data Rate

- 200 ms transfer rate with 20 loudspeakers

TWISTED-PAIR CONFIGURATIONS

Some basic twisted-pair configurations are shown in Figure 1 and Figure 2. To ensure optimum performance when designing twisted-pair RMS systems, pay close attention to wiring, cable gauge, and connector requirements (see “Network Specifications” on page 29).

⚠ **CAUTION:** Consider using a repeater in twisted-pair configurations if you are nearing 1,640 ft of total cable length, or if you are using VEAM connectors.

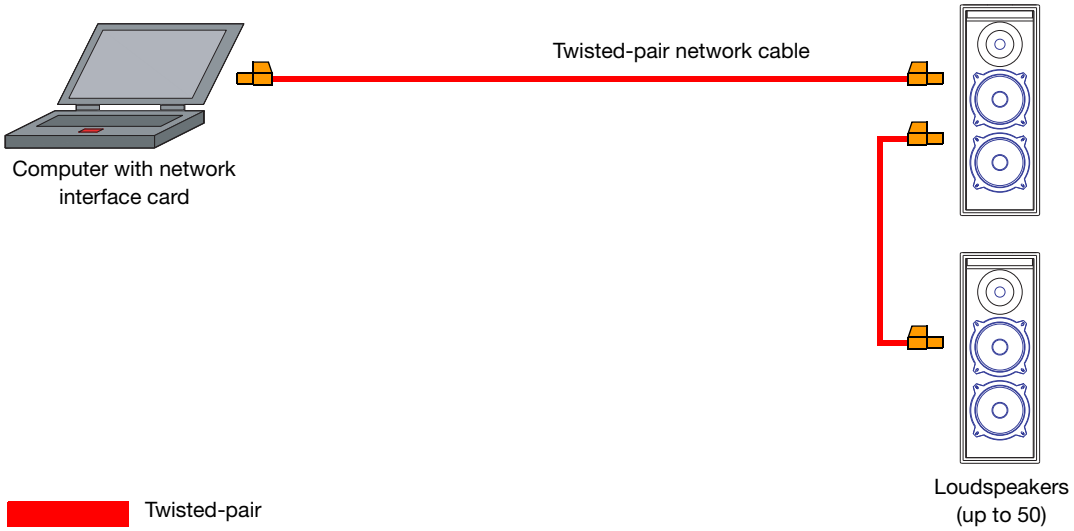


Figure 1: Basic Twisted-Pair Configuration

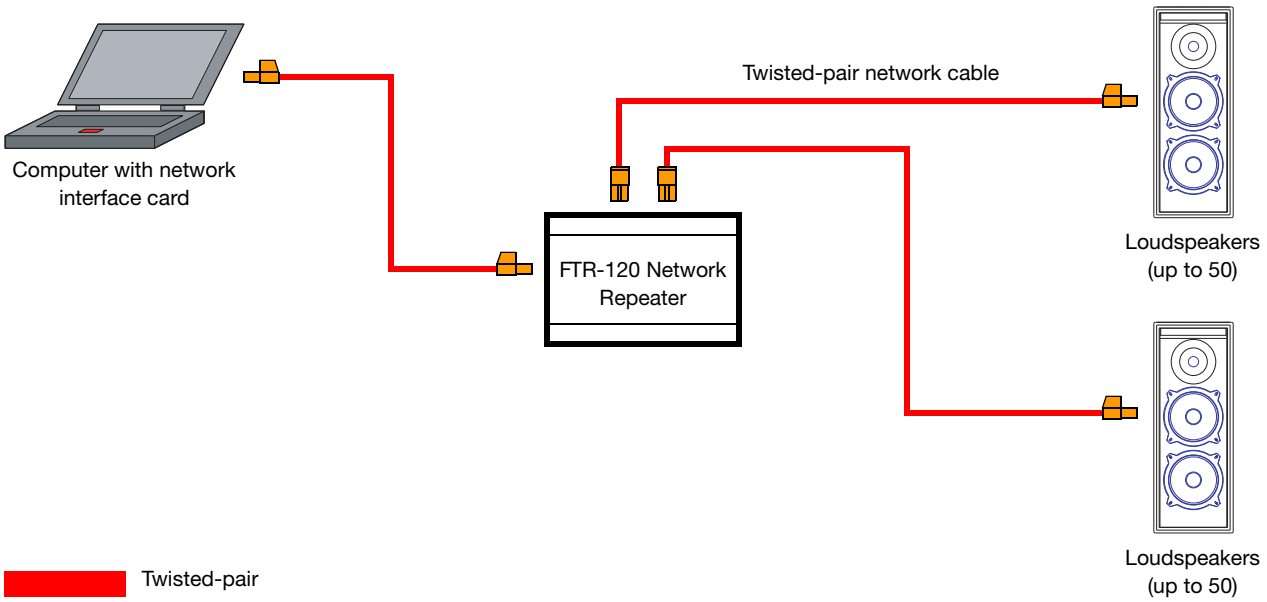


Figure 2: Twisted-Pair Configuration with Network Repeater

Twisted-Pair with Termination (Small- to Mid-Sized Venues)

Figure 3 illustrates a twisted-pair configuration with a termination panel, which is often used in small- to mid-sized venue configurations. Proper planning of cable runs to loudspeakers and termination points are important for reducing excess cable in the network and minimizing network latency.

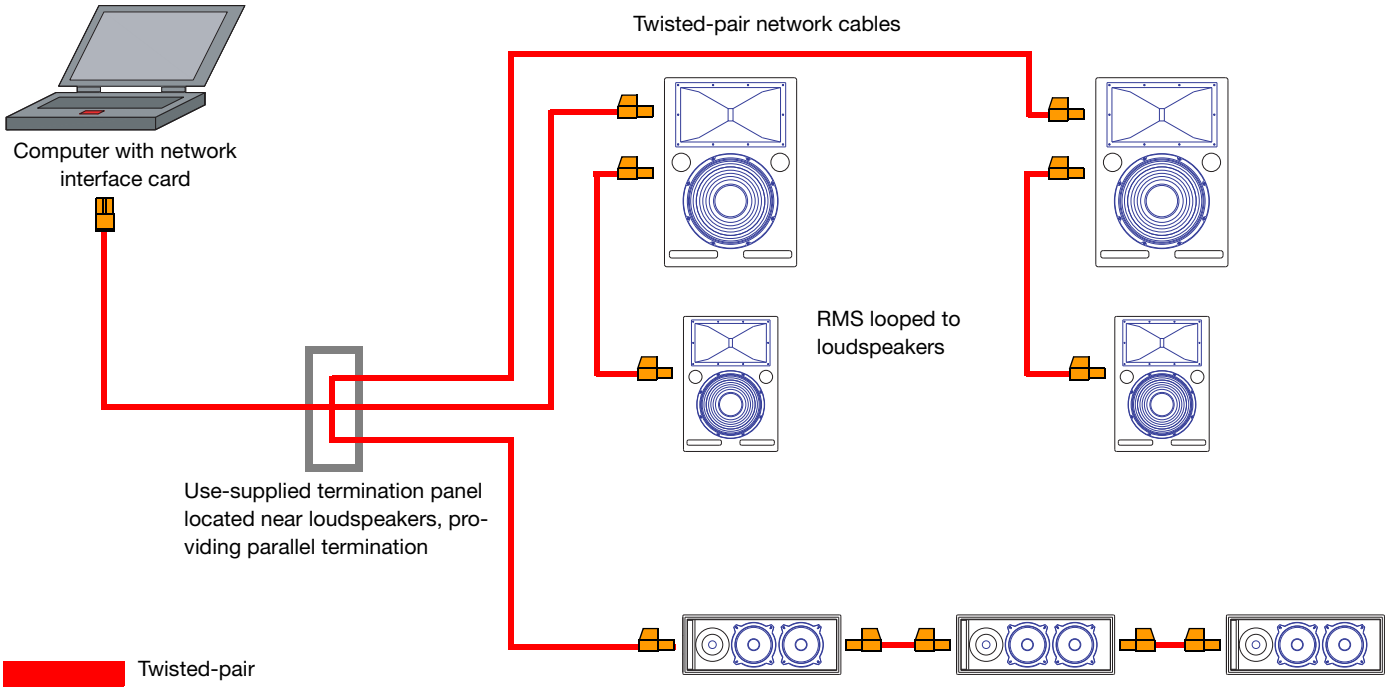

Twisted-pair network cables
Computer with network interface card
RMS looped to loudspeakers
Use-supplied termination panel located near loudspeakers, providing parallel termination
Twisted-pair

Figure 3: Twisted-Pair Configuration with Termination

Twisted-Pair with Custom Connectors (Touring and Portable Applications)

Touring and portable applications may require a more flexible and portable solution for twisted-pair cabling. Figure 4 illustrates a configuration where RMS data is connected to front-of-house with a “dry pair” on an analog multi-pair snake system.

For these configurations, a proprietary cable connector, such as a 5-pin XLR, can be used to avoid any confusion with standard 3-pin XLR audio cables.

⚠ **CAUTION:** When custom RMS cables are patched through active or passive audio splitters and transformers, the RMS signal is lost.

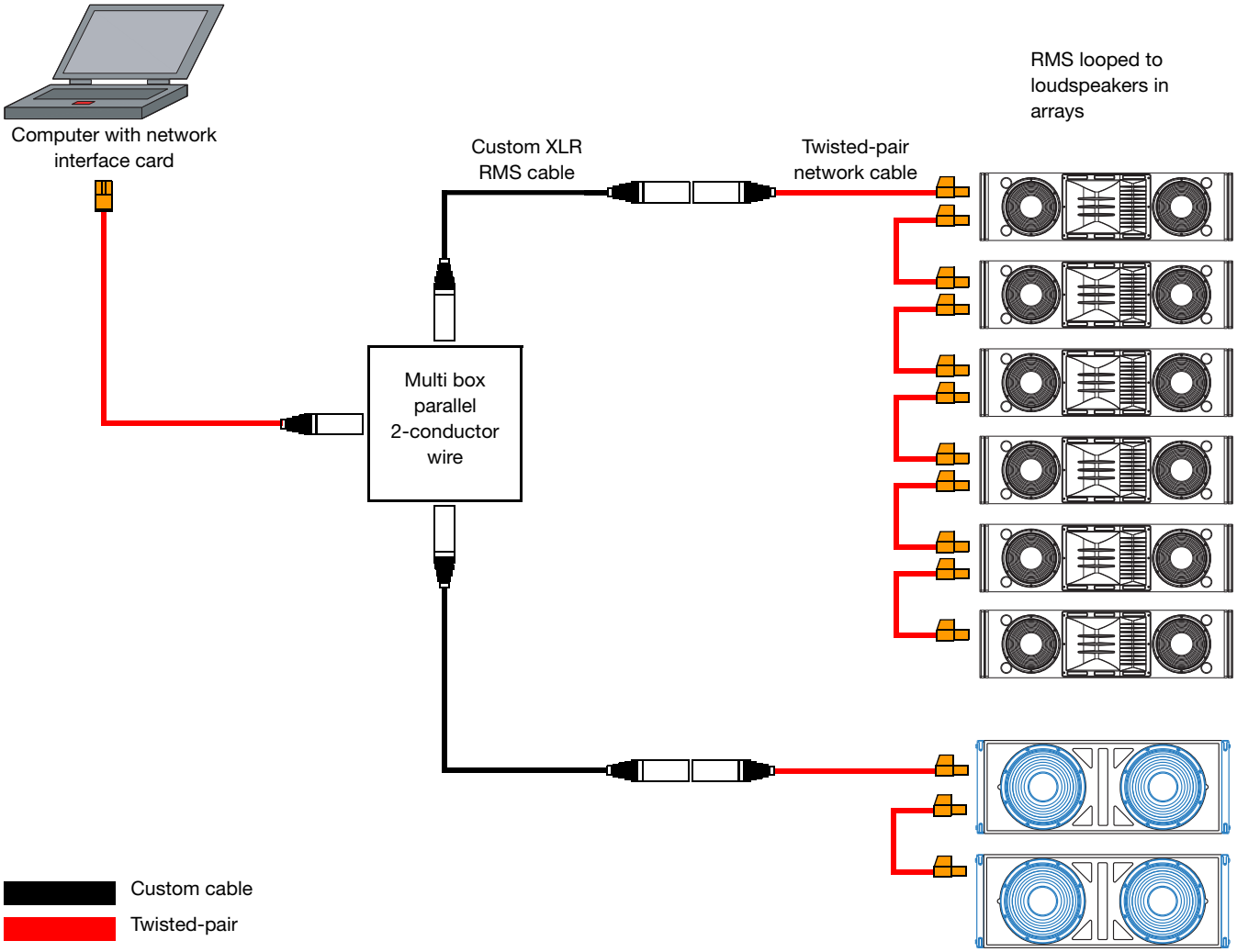


Figure 4: Twisted-Pair Configuration with Custom Connectors

ETHERNET CONFIGURATIONS

Compared to twisted-pair configurations, Ethernet-based RMS networks can have a larger number of loudspeakers on a single network, a wider area of available locations, and faster network speeds. Figure 5, Figure 6, and Figure 7 illustrate some basic Ethernet configurations.

NOTE: The maximum length for Ethernet cables is 328 ft (1oo m). Do not exceed this length when connecting i.LON 10s to your computer, as well as to Ethernet switches and hubs.

NOTE: Ethernet-based RMS system must conform to Ethernet network design specifications (beyond the scope of this guide). A general knowledge of Ethernet networks is very helpful if you plan to deploy an Ethernet-based RMS system.

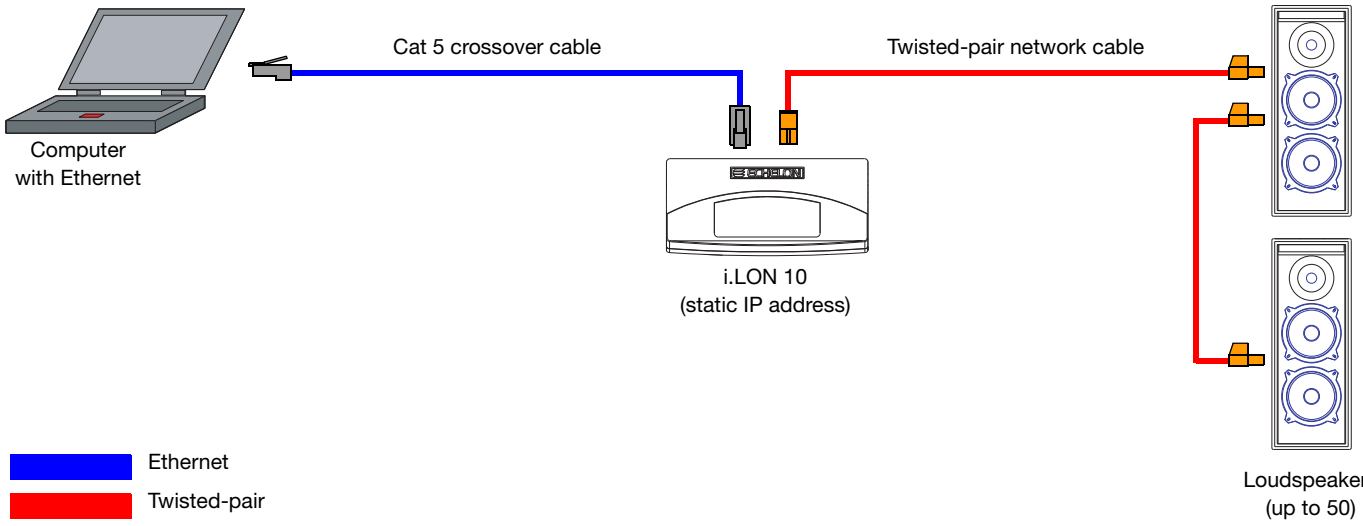


Figure 5: Basic Closed Ethernet Configuration

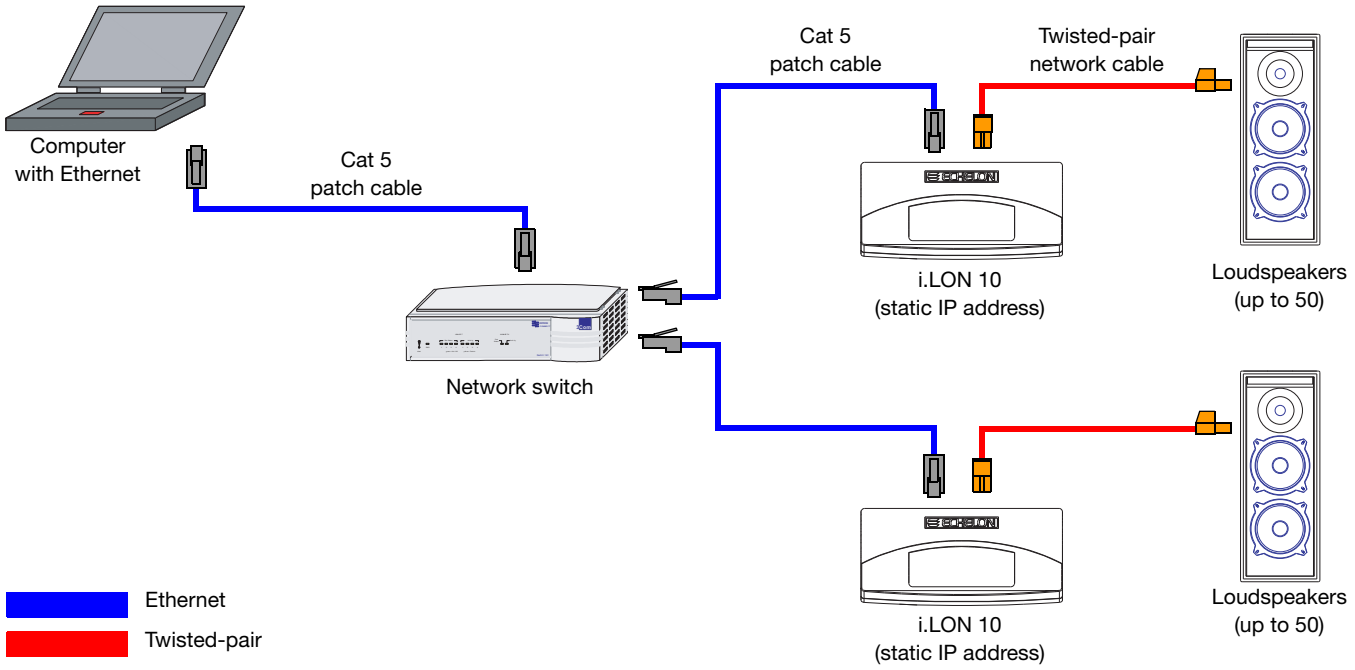


Figure 6: Basic Closed Ethernet Configuration with Multiple i.LON 10s

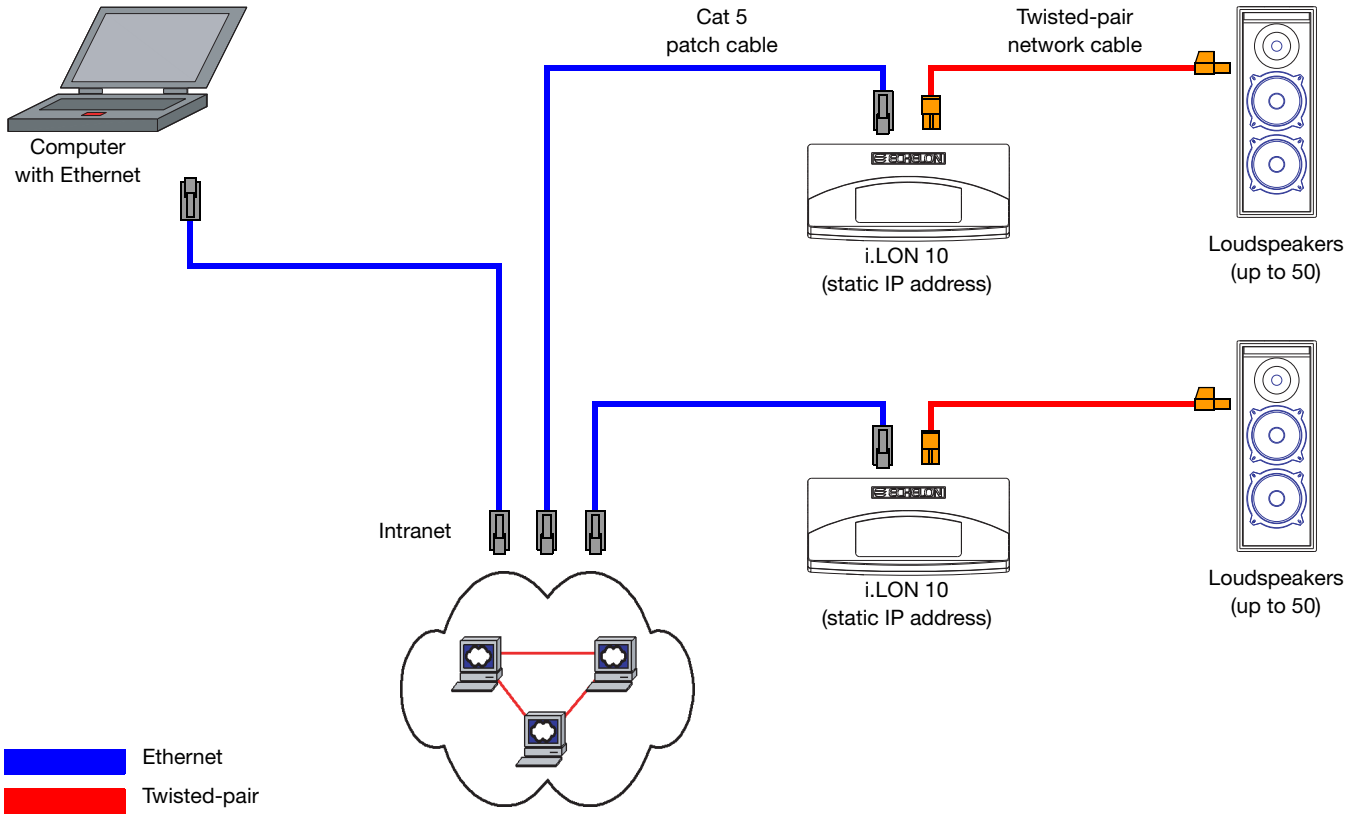


Figure 7: Basic Ethernet Configuration Using Existing Intranet Infrastructure

NOTE: For Ethernet-based RMS configurations, a closed, separate network is recommended to reduce congestion from outside network traffic.

Ethernet and Twisted-Pair Hybrid System (Large Venue Applications)

For larger venues such as theatres, stadiums, arenas, hotels, and theme parks, an Ethernet-based network using multiple i.LON 10s is preferred for increased network speed.

When designing an Ethernet-based system, it is still necessary to convert to twisted pair from the i.LON 10 to your loudspeaker locations. Doing so allows you to form a hybrid network of twisted-pair and Ethernet cabling.

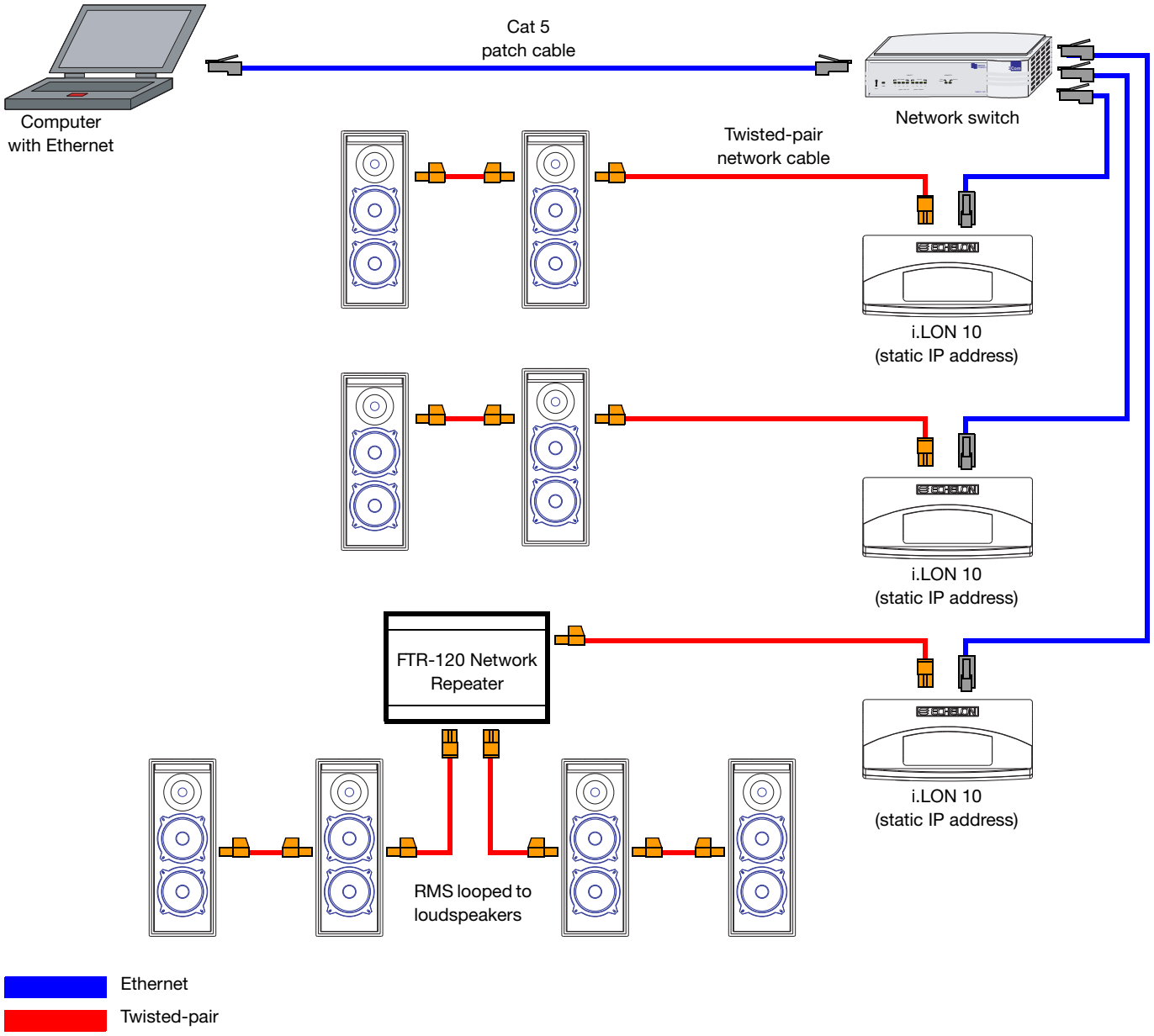


Figure 8: Ethernet and Twisted-Pair Hybrid System

NOTE: Even with multiple i.LON 10s, a system may still require a network repeater. It is possible to overload an RMSNET group by exceeding the maximum recommended length of twisted-pair cabling for the loudspeaker node. For information on cabling requirements, see “Network Specifications” on page 29.

CHAPTER 6: USING THE RMS SOFTWARE

The RMS program is where you create virtual loudspeaker layouts in panels with loudspeaker views. The software provides extensive system status and performance data for each loudspeaker, including amplifier voltage, limiting activity, power output, fan and driver status, as well as mute, solo, and wink capability. Loudspeaker data is updated 2–5 times per second. Loudspeaker icons and views can be arranged to represent how the loudspeakers have been deployed in the system. Multiple panels can be saved and recalled for specific performances and venues.

This chapter documents using the RMS program and includes the following topics:

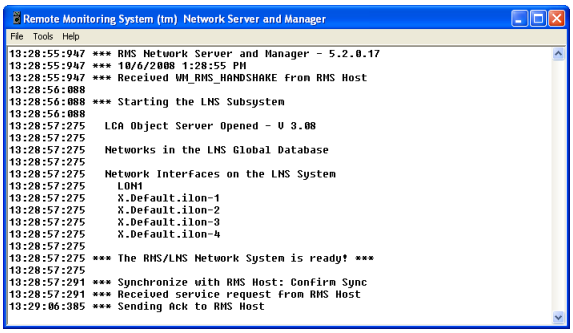
- “Launching RMS the First Time” on page 37
- “The RMS Workspace” on page 39
- “Adding Loudspeakers” on page 41
- “Loudspeaker Views” on page 45
- “Working with Loudspeaker Icons” on page 48
- “The Mute, Solo, and Wink Buttons” on page 49
- “Muting Options” on page 50
- “Optimized Muting” on page 52
- “UX Attenuation Range” on page 52

LAUNCHING RMS THE FIRST TIME

After you have installed the RMS software and configured your network interface, you are ready to launch the RMS program. The first time you launch RMS you are prompted to configure an RMS network database.

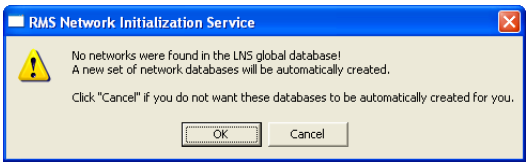
To launch RMS:

1. From the Windows Start menu, choose **Start > All Programs > Meyer Sound > Remote Monitoring System**, or double-click the RMS shortcut from the desktop. The RMS Network Server and Manager opens displaying information about your network interlace.


Remote Monitoring System (tm) Network Server and Manager
File Tools Help
13:28:55:947 *** RMS Network Server and Manager - 5.2.0.17
13:28:55:947 *** 10/6/2008 1:28:55 PM
13:28:55:947 *** Received WM_RMS_HANDSHAKE from RMS Host
13:28:56:088
13:28:56:088 *** Starting the LNS Subsystem
13:28:56:088
13:28:57:275 LCA Object Server Opened - V 3.08
13:28:57:275
13:28:57:275 Networks in the LNS Global Database
13:28:57:275
13:28:57:275 Network Interfaces on the LNS System
13:28:57:275 LON1
13:28:57:275 X.Default.ilon-1
13:28:57:275 X.Default.ilon-2
13:28:57:275 X.Default.ilon-3
13:28:57:275 X.Default.ilon-4
13:28:57:275
13:28:57:275 *** The RMS/LNS Network System is ready! ***
13:28:57:275
13:28:57:291 *** Synchronize with RMS Host: Confirm Sync
13:28:57:291 *** Received service request from RMS Host
13:29:06:385 *** Sending Ack to RMS Host

NOTE: If you chose to add an RMS icon to your Startup folder during the RMS software installation, RMS automatically launches when Windows starts.

2. If your system does not yet have an RMS network database, you are prompted to create one. Click **OK** to create the new network database. The database is written to **C:\meyer\rms** and the RMS program opens.


RMS Network Initialization Service
No networks were found in the LNS global database!
A new set of network databases will be automatically created.
Click "Cancel" if you do not want these databases to be automatically created for you.
OK
Cancel

NOTE: RMS network database folders are titled “RMSNET” for network interface cards and U10 USB adapters. For i.LON 10s, the database folders are numbered (RMSNET1, RMSNET2, etc.).

⚠ **CAUTION:** If you are prompted with a message stating "The object was not found," your network interface is not connected to a loudspeaker. Click **OK** and check your cable connections between the network interface and loudspeakers.

About the Network Server and Manager

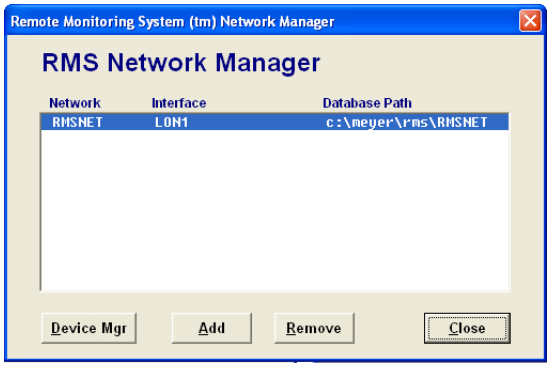
The RMS Network Server and Manager is the communication layer between the RMS program and your loudspeakers. It runs minimized in the background and is accessible from the Windows taskbar. The RMS Network Server and Manager has options for removing and importing databases, as well as options for working with loudspeakers on the network (such as getting info, winking, setting offline, and removing). The RMS Network Server and Manager automatically closes when the RMS program is closed.

Removing Network Databases

You can use the RMS Network Server and Manager to remove a database from the RMS network to deactivate it, or so it can be moved to another computer.

To remove an RMS network database:

1. Launch RMS and open the **RMS Network Server and Manager**.
2. Choose **Tools > Network Manager**.
3. In the RMS Network Manager dialog box, select the database you want to remove and click **Remove**.



4. When prompted to confirm the removal of the database from the network, click **Yes**.
5. When prompted with the RMS Network Remove Service dialog, click **Yes**. The database is removed from the network and renamed with a date and time stamp. The renamed database resides in the **C:\meyer\rms** folder on your hard drive.

Importing RMS Network Databases

If you are upgrading to a new version of RMS, or if you have moved your database files to a new host computer, you can import the RMS database.

To import an RMS network database:

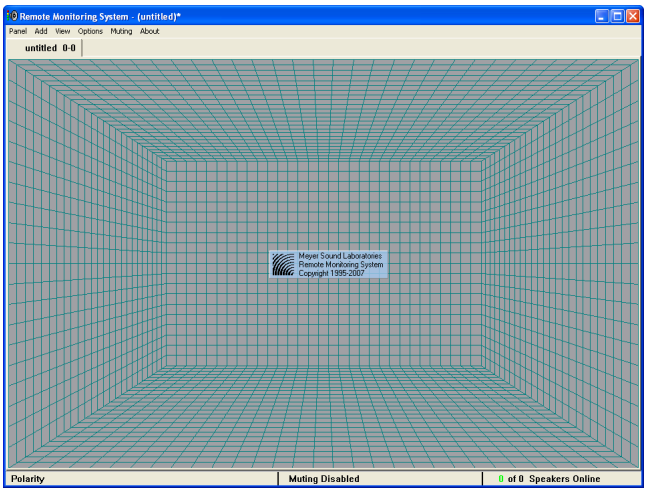
1. If RMS is currently running, choose **Panel > Exit** to quit.
2. Locate the RMSNET folder you want to import and copy it to the **C:\meyer\rms** folder.
3. Launch RMS and open the **RMS Network Server and Manager**.
4. Choose **Tools > Network Manager**.
5. In the RMS Network Manager dialog box, click **Add**.
6. In the Add RMS/LNS Network dialog, select one of the following options:

- **Default network (RMSNET):** Imports a database for one of the network interface cards.
- **Remote network (RMSNETx):** Imports a database for an i.LON 10.

7. If you are importing an i.LON 10 database, enter the **Assigned Network Number** for the i.LON 10. For example, for an i.LON 10 named "ilon-1" with an IP address of 192.168.1.101, enter a value of 1.
8. Click **Add Network only (for Import)**.
9. When prompted to confirm the import, click **OK** and then **Yes**. The loudspeaker nodes are imported with the network database.

THE RMS WORKSPACE

RMS configurations are saved in panel files (.PNL). Panels can contain multiple pages, accessed as tabs at the top of the window, which represent different loudspeaker views. The first time you run RMS, a blank panel is created with one untitled page.



RMS Window with Blank Panel

Working with Panels

Creating New Panels

To create a new panel file:

1. Choose **Panel > New**.
2. If you are prompted to save changes to the current panel file, click **Yes** to save the changes.

New panels contain a single untitled page.

Saving Panels

To save a panel file:

1. Choose **Panel > Save** or **Panel > Save As**.
2. In the Save As dialog box, enter a filename and location for the panel and click **Save**.

Compatibility for RMS 5.2 Panels

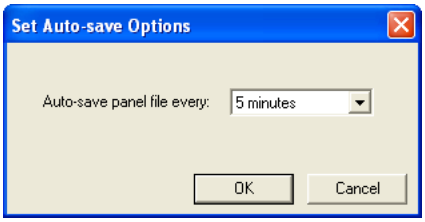
Panels saved in RMS 5.2 are not compatible with older versions of RMS. If you are resaving existing panels in RMS 5.2 and need them to be compatible with another system running an older version of the RMS software, make sure to keep a backup of the older panel files.

Automatically Saving Panels

By default, RMS automatically saves panel files (every 30 seconds) to a backup file while working in the RMS program. This ensures that important changes to panel files are retained even if you forget to save them. The backup file (rms_autosave.pnl) is saved to the RMS folder on your hard drive. You can configure the Autosave option to automatically save at a different time interval, or not at all.

To configure Autosave settings:

1. Choose **Panel > Autosave**.
2. In the Autosave dialog box, specify the duration for how often the panel will be automatically saved:



- 30 seconds
- 1 minute
- 5 minutes
- 10 minutes
- 30 minutes
- Never

3. Click **OK**.

Opening Panels

To open a panel file:

1. Choose **Panel > Open**.
2. If you are prompted to save changes to the current panel file, click **Yes** to save the changes.
3. In the Open dialog box, select the panel you want to open and click **Open**.

TIP: Panel files cannot be launched by double-clicking them from Windows Explorer.

TIP: RMS remembers the last panel file saved and automatically opens it when the RMS program is launched.

Setting the Panel Background

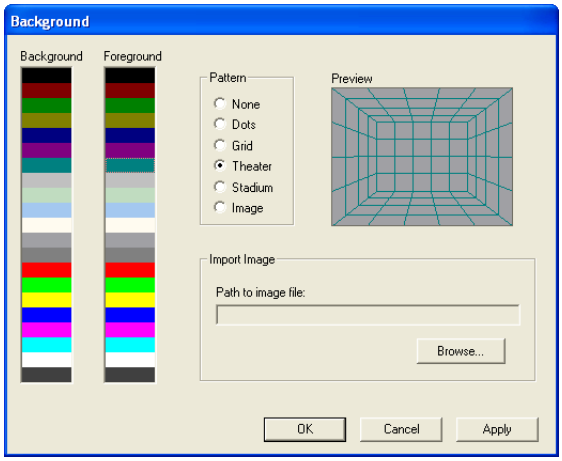
You can set the panel background to different colors and patterns, or you can import a custom image to use as the panel background. Supported image formats for the panel background include .jpg, .gif, .bmp, .tif, .png, .exif, .wmf, .emf, and .ico.

NOTE: The panel background is applied to all pages in the panel.

To set the panel background:

1. Do one of the following:

- Choose **Options > Background > Import Image** or right-click on the panel background and choose **Background**. The Background dialog box opens.



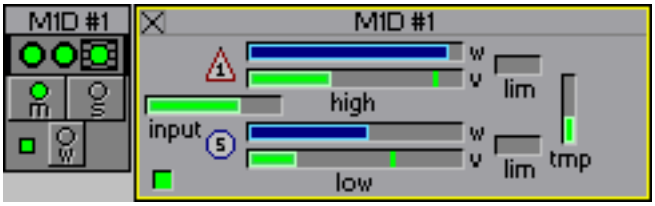
2. Do one of the following:

- To use a background pattern, set **Pattern** to Dots, Grid, Theater, or Stadium and choose a **Background** and **Foreground** color.
- To import a background image, set **Pattern** to Image. Click **Browse** and select the image you want to import and click **Open**.

3. Click **OK**. The Background dialog box closes and the new panel background is displayed.

Outdoor Mode

When enabled, Outdoor mode adjusts the colors in the RMS program so parameters and meters are more visible when working outside in daylight.



Loudspeaker Views Displayed in Outdoor Mode

To enable Outdoor mode:

- Select **Options > Outdoor Mode** or right-click on the panel background and choose **Outdoor mode**.

Working with Pages

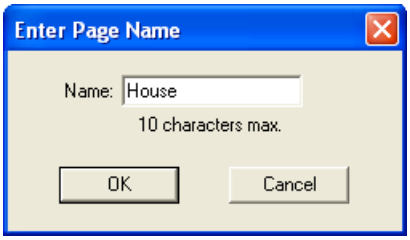
Panel files can contain multiple pages, up to 20, that represent different loudspeaker groups or loudspeaker views. For example, you may want to monitor the main house system on one page and the stage monitor system on another page. Pages are available as tabs at the top of the RMS window.

Adding Pages

To add a page to a panel:

1. Choose **Panel > Add Page**.

2. In the Enter Page Name dialog box, enter a **Name** for the page using up to 10 characters.



3. Click **OK**. The new page is added to the panel and appears as a tab at the top of the RMS window, to the right of the last page created.

Navigating Pages

To navigate the pages in a panel:

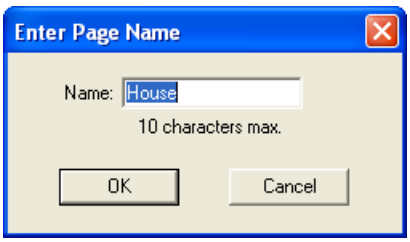
- Click a tab at the top of the RMS window to display that page.
- Press Tab to cycle through the pages left to right.
- Press Shift+Tab to cycle through the pages right to left.
- Use the numeric keypad to select the first 10 pages.

TIP: When RMS encounters loudspeakers with limiting, excursion, or other concerns, the page that contains the loudspeakers is automatically selected.

Renaming Pages

To rename a page:

1. At the top of the RMS window, click the tab for the page you want to rename.
2. Choose **Panel > Rename Page**.
3. In the Enter Page Name dialog box, enter a **Name** for the page using up to 10 characters.

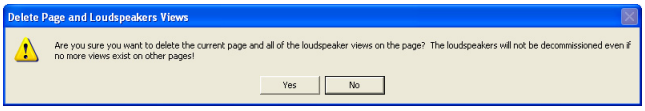


4. Click **OK**. The page is renamed.

Deleting Pages

To delete a page:

1. At the top of the RMS window, click the tab for the page you want to delete.
2. Choose **Panel > Delete Page**.
3. When prompted to confirm the deletion, click **Yes**.


Delete Page and Loudspeakers Views
Are you sure you want to delete the current page and all of the loudspeaker views on the page? The loudspeakers will not be decommissioned even if no more views exist on other pages!
Yes
No

NOTE: Loudspeakers on a deleted page are not decommissioned.

ADDING LOUDSPEAKERS

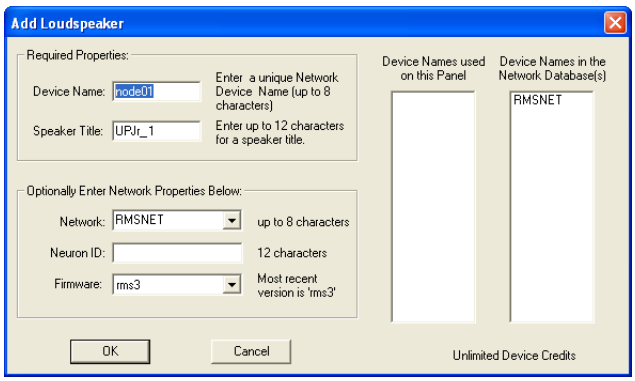
Once you have created a panel with pages, the next step is to add the loudspeakers you want to monitor. Loudspeakers do not need to be connected to the RMS network before they are added in the RMS software. This allows you to build RMS panels without the loudspeakers being present. However, in order for loudspeakers to be monitored in RMS, they must be connected to the network and commissioned. Commissioning is the process of identifying the loudspeaker by its Neuron ID (NID) so it is linked to the network. After commissioning, it is possible to remove the loudspeaker or decommission it from the network. Commissioned and uncommissioned loudspeakers reside in the RMS device database.

Adding and Commissioning Loudspeakers

When adding a loudspeaker you can choose to commission it in the Add Loudspeaker dialog box. To commission a loudspeaker you must either enter its Neuron ID or press its Service button when prompted.

To add and commission a loudspeaker:

1. From the **Add** menu, select the loudspeaker model you want to add, or right-click on the panel background and select the loudspeaker model from the pop-up menu. The Add Loudspeaker dialog box opens.



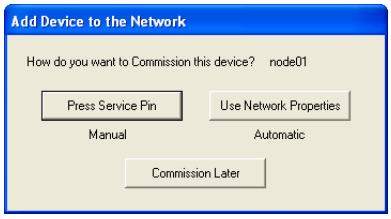
2. If you want to override the default **Device Name**, enter a unique name using up to eight characters. This name can contain only alphanumeric characters and hyphens (no spaces). Device names are used to identify loudspeakers in the RMS database.

TIP: The device name is automatically generated and includes a number that is incremented each time a new loudspeaker is added. However, it may be useful to override the name with one that describes the loudspeaker type and its location within the system.

3. Enter a **Speaker Title** using up to 12 characters. This name does not need to be unique and it can contain spaces and punctuation characters. Loudspeaker titles are used to identify loudspeakers in the RMS panel.
4. Enter the following Network Properties:

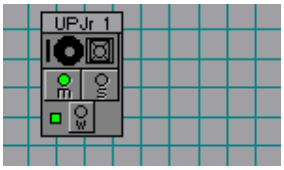
- **Network:** The RMS network for the loudspeaker (such as RMSNET, or RMSNET1 if connected to an i.LON 10 Ethernet Adapter).
- **Neuron ID:** The loudspeaker's 12-character Neuron ID (NID), which can be found on the loudspeaker's user panel near the orange Network jacks.
- **Firmware:** Specify rms3 for loudspeakers manufactured in the year 2000 and later; these models have an RMS3 label on the RMS user panel. For earlier loudspeaker models, use Prod6H.

5. When prompted with the Add Device to the Network dialog box, click one of the following buttons:



- Click **Press Service Pin** to manually commission the loudspeaker. You must then manually press the Service button on the loudspeaker's RMS user panel when prompted. This will send the loudspeaker's Neuron ID so the loudspeaker can be identified on the network. To use this option the loudspeaker must be powered on and connected to the network.
- Click **Use Network Properties** to automatically commission the loudspeaker. To use this option the loudspeaker must be powered on, connected to the network, and its Neuron ID must have been entered correctly in the Add Loudspeaker dialog box.
- Click **Commission Later** to commission the loudspeaker later. Use this option if the loudspeaker is not yet connected to the network, or if you will perform a batch commission later.

  Commissioned loudspeakers have a green LED in the lower left of their loudspeaker icon. Loudspeakers that have not been commissioned instead have a red LED.



Commissioned Loudspeaker

NOTE: By default, loudspeakers are displayed in Icon View, which provides a graphic representation of the loudspeaker. Additional views include Small Icon View, Meter View, and Text View. For more information, see "Loudspeaker Views" on page 45.

TIP: You can use the RMS Configuration Sheet to keep track of loudspeaker serial numbers, Neuron IDs, and device names (see the "RMS Configuration Sheet" on page 67).

Commissioning Loudspeakers After the Fact

Individual loudspeakers that have been added to a page and not yet commissioned can be commissioned after the fact. Commissioning is also necessary if the loudspeaker was temporarily removed from the network.

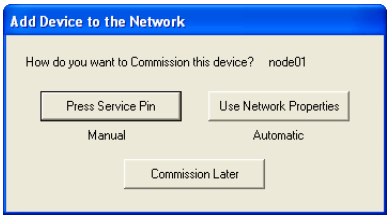
TIP: Decommissioned loudspeakers have a red LED in the lower left of their loudspeaker icon.

To commission a loudspeaker:

1. Select the page containing the loudspeaker you want to commission.
2. If you know the loudspeaker's Neuron ID and have not yet specified it for the loudspeaker, do the following:

- Right-click the loudspeaker and choose **Network Properties**.
- In the Network Properties dialog box, enter the loudspeaker's 12-character **Neuron ID** (NID), which can be found on the loudspeaker's user panel near the orange Network jacks.
- Click **OK**.

3. Right-click the loudspeaker and choose **Commission**.
4. When prompted with the Add Device to the Network dialog box, do one of the following:



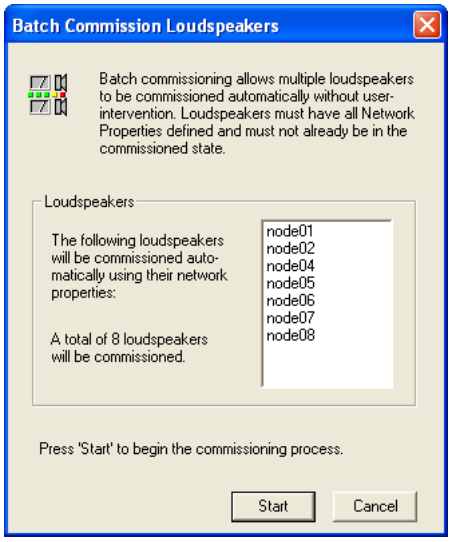
- If you have not entered the loudspeaker's Neuron ID, click **Press Service Pin**. When prompted, press the Service button on the loudspeaker's RMS user panel. The loudspeaker is commissioned. To use this option the loudspeaker must be powered on and connected to the network.
- If you previously entered the loudspeaker's Neuron ID — either when adding the loudspeaker, or in the Network Properties dialog box — click **Use Network Properties**. The loudspeaker is commissioned. To use this option the loudspeaker must be powered on, connected to the network, and its Neuron ID must have been previously entered correctly.

Batch Commissioning Loudspeakers

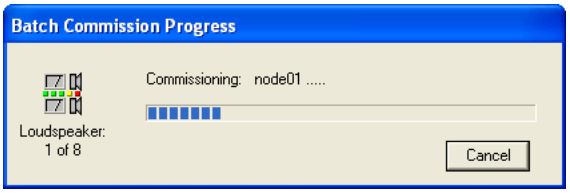
Batch commissioning allows you to automatically commission multiple loudspeakers in a single operation. This is especially useful when building an RMS panel offline (with no loudspeakers connected), or when adding several new loudspeakers to an existing panel. Use the procedure described in "Adding and Commissioning Loudspeakers" on page 41 to add loudspeakers to the panel with their unique Neuron IDs.

To commission loudspeakers in a batch:

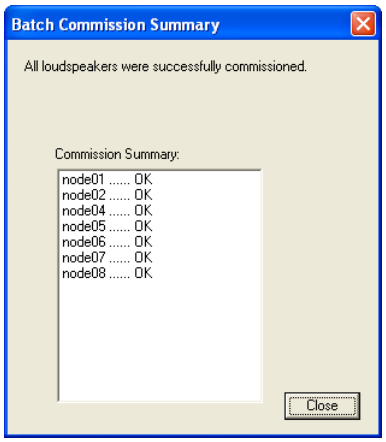
1. Choose **Options > Batch Commission**. The Batch Commission Loudspeakers dialog box opens, displaying a list of loudspeakers that will be commissioned.


Batch Commission Loudspeakers
Batch commissioning allows multiple loudspeakers to be commissioned automatically without user-intervention. Loudspeakers must have all Network Properties defined and must not already be in the commissioned state.
Loudspeakers
The following loudspeakers will be commissioned automatically using their network properties:
A total of 8 loudspeakers will be commissioned.
node01
node02
node04
node05
node06
node07
node08
Press 'Start' to begin the commissioning process.
Start
Cancel

2. Click **Start**. The Batch Commission Progress dialog box appears as the loudspeakers are commissioned.



3. Once the batch process has completed, a Batch Commission Summary dialog box opens, displaying a list of loudspeakers that have been successfully commissioned. Click **Close**.



CAUTION: Commissioning for an individual loudspeaker will fail if its Neuron ID was entered incorrectly in the Network Properties dialog box, or if it is not powered on and connected to the network.

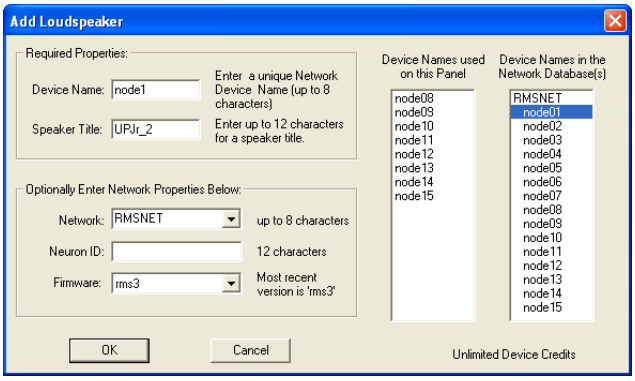
Adding Loudspeakers from other Panels and Pages

Once a loudspeaker has been added to a panel it resides in the RMS device database. Any loudspeaker in the device database can be easily added to another panel or page without having to recommission the loudspeaker and re-enter its info, thereby speeding up the process of adding loudspeakers.

NOTE: Loudspeakers that have been added to the RMS device database are not generic placeholders. Each unique device corresponds to a physical loudspeaker that can be identified on the network.

To add a loudspeaker from another panel or page:

1. Select the page to which you will add the loudspeaker.
2. From the **Add** menu, select the loudspeaker model you want to add, or right-click on the panel background and select the loudspeaker model from the pop-up menu. The Add Loudspeaker dialog box opens.



3. Select the loudspeaker you want to add:

- If the loudspeaker resides in the current panel on another page, select its device name in the **Device Names Used on This Panel** column.
- If the loudspeaker resides in another panel, select its device name in the **Device Names in the Network Database** column.

4. Enter a **Speaker Title** using up to 12 characters. This name does not need to be unique and it can contain spaces and punctuation characters. Loudspeaker titles are used to identify loudspeakers in the RMS panel.

TIP: If the loudspeaker has already been commissioned, it is not necessary to enter its Neuron ID.

5. Click **OK**. The loudspeaker is added to the page.

Managing Loudspeakers

Renaming Loudspeakers

To rename a loudspeaker:

1. Select the page containing the loudspeaker you want to rename.
2. Right-click the loudspeaker and choose **Rename**.
3. In the Rename Speaker dialog box, enter the new loudspeaker name using up to 12 characters. The name does not need to be unique and it can contain spaces and punctuation characters.
4. Click **OK**. The loudspeaker is renamed.

Decommissioning Loudspeakers

Decommissioned loudspeakers that are online and connected to the RMS network are identified with a red LED in the lower left of their icons; in Text view, these loudspeakers are further identified with a “DE-COMM” label. Control of loudspeakers (muting, soloing, etc.) from the RMS network is only possible once they’ve been commissioned.

Decommissioned Loudspeaker

Offline Loudspeakers

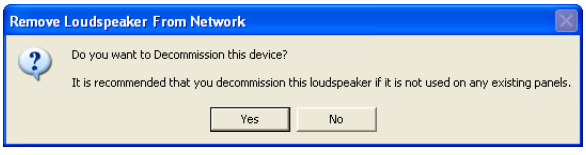
If a loudspeaker icon displays both a red LED in the lower left and a yellow “i” in the lower right, then the loudspeaker is commissioned and offline.

Offline Loudspeaker

Deleting Loudspeakers

To delete a loudspeaker:

1. Select the page containing the loudspeaker you want to delete.
2. Right-click the loudspeaker and choose **Delete**.
3. When prompted to confirm the deletion, click **Yes**. The loudspeaker is removed from all pages in the panel.
4. When prompted with the Remove Loudspeaker from Network dialog box, click **Yes** to decommission the loudspeaker and remove it from the database. If you intend to use the loudspeaker in a different panel or page, click **No** to keep the loudspeaker commissioned.


Remove Loudspeaker From Network
Do you want to Decommission this device?
It is recommended that you decommission this loudspeaker if it is not used on any existing panels.
Yes
No

TIP: You can also remove loudspeakers in the RMS Network Server and Manager (from the Network Manager dialog box).

LOUDSPEAKER VIEWS

RMS provides the following four loudspeaker views:

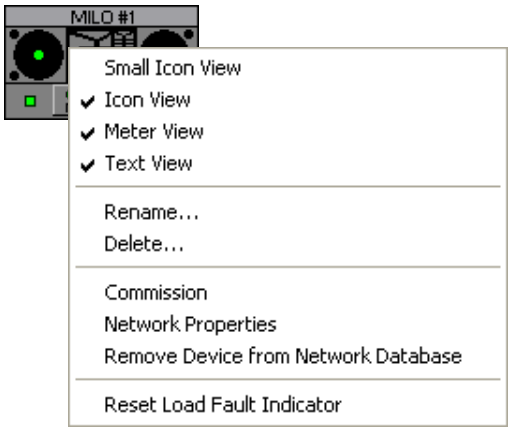
- Small Icon View
- Icon View
- Meter View
- Text View

The available parameters displayed in each view varies depending on the type of loudspeaker.

Displaying Loudspeaker Views

To display a loudspeaker view, do any of the following:

- Right-click any loudspeaker view and select the view you want to display. To hide a view, deselect it from the menu.

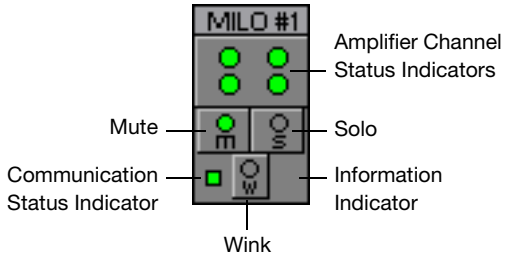


- Double-click an Icon View or Small Icon View to display Meter View. Double-click the Icon View again, or double-click the Meter View, to display Text View.
- Triple-click an Icon View or Small Icon View to display both Meter View and Text View.

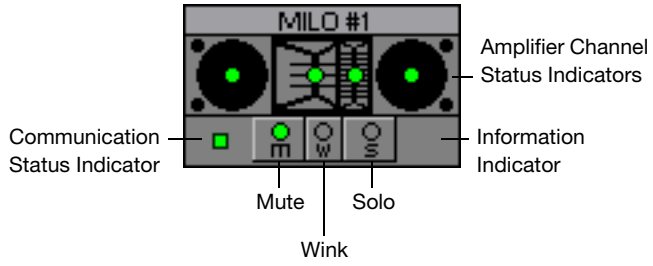
CAUTION: A loudspeaker must always have at least one view open. If you attempt to close all views for a loudspeaker you will be prompted to delete the loudspeaker.

Icon View and Small Icon View

Icon View (the default loudspeaker view) and Small Icon View are graphic representations of the loudspeaker. In addition to providing feedback on the loudspeaker's amplifier channels, these views also have buttons for Mute, Solo, and Wink, as well as Communication and Information indicators.



Small Icon View for MILO Loudspeaker



Icon View for MILO Loudspeaker

Table 3 provides a list of the parameters for the MILO high-power curvilinear array loudspeaker when in Icon View and Small Icon View.

Table 3: Icon View Parameters for MILO Loudspeaker

Parameter	Function	
Amp. Channel Status Indicators	Green	0 < Voltage (norma)l
	Yellow	Voltage present without power (open driver circuit)
	Red	Indicates limiting
	Orange	Indicates excursion
	Gray	No voltage present
Mute (M) Button	Green	Not muted
	Red	Muted
Solo (S) Button	Gray	Not soloed
	Yellow	Soloed
Wink (W) Button	Gray	Not winked
	Green	Winked

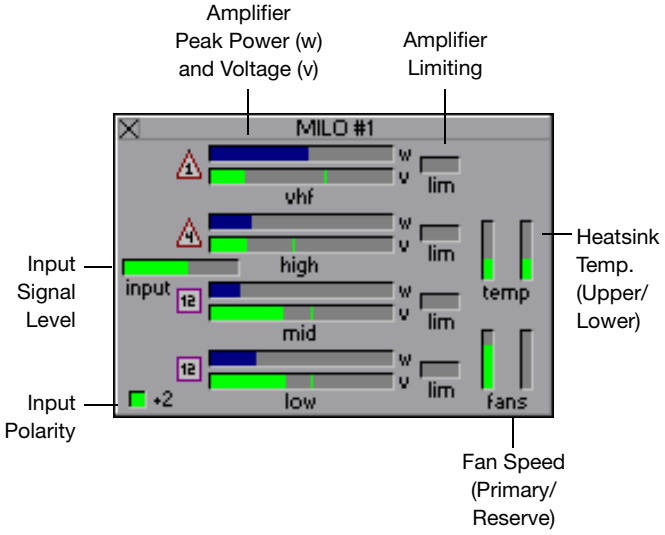
Table 3: Icon View Parameters for MILO Loudspeaker

Parameter	Function	
Communication Status Indicator	Green	Loudspeaker commissioned and online
	Red	Loudspeaker not commissioned or offline
Information Indictor	Yellow "i"	Indicates one or more of the following: • Amplifier heat sink >77° C • No Primary Fan current • Primary Fan current >97% • Reserve Fan on • Driver open circuit • Driver short circuit • Loudspeaker offline

NOTE: In Icon View and Small Icon View, the Mute and Solo buttons are unavailable (dimmed) when muting is disabled in the Muting Options dialog box. For more information, see "Muting Options" on page 50.

Meter View

Meter View uses graphic meters to represent power usage, voltage, fan speed, and temperature. Meter View is the only loudspeaker view that does not provide controls for Mute, Solo, and Wink.



Meter View for MILO Loudspeaker

TIP: Meter Views can be closed by clicking the Close (X) button in the upper left corner.

Table 4 provides a list of the parameters for the MILO high-power curvilinear array loudspeaker when in Meter View.

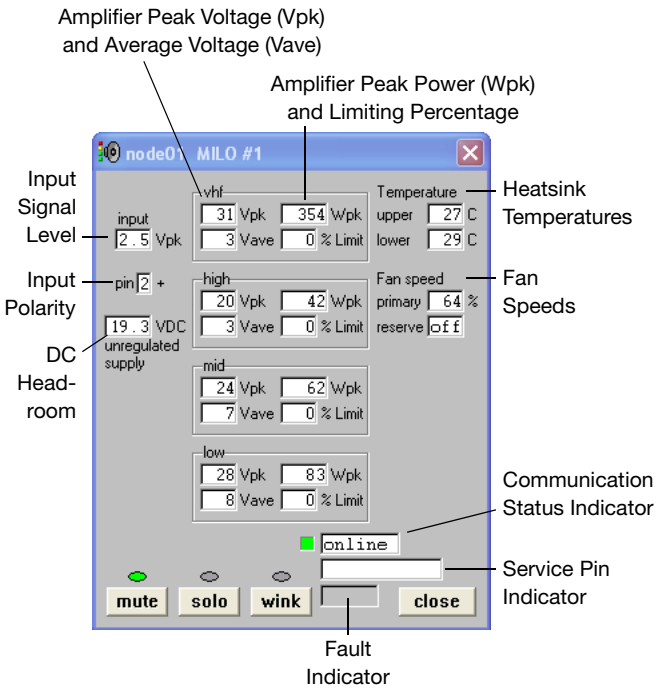
Table 4: Meter View Parameters for MILO Loudspeaker

Parameter	Function	
Amplifier Peak Power	For each amplifier channel, the peak power output in watts	
Amplifier Voltage	For each amplifier channel, the voltage output (0–100 V). A small momentary bar marks peak voltage. Segmented bar conditions are:	
	Green	0 < Voltage < 50 V
	Yellow	50 < Voltage < 90 V
	Red	90 < Voltage < 100 V
	No Bar	Voltage = 0
	Entire Bar Yellow	Open driver circuit
Amplifier Limiting	For each amplifier channel, the percentage of limiting	
Input Signal Level	Measures 0–10 V and indicates the following conditions:	
	Green	0 < Signal Level < 8 V
	Yellow	8 < Signal Level < 9 V
	Red	9 < Signal Level < 10 V
Input Polarity	+2	Pin 2 hot (No Polarity switch for the MILO)
Heatsink Temperature	Amplifier temperatures: upper and lower	
Fan Speeds	Amplifier cooling fans: primary and reserve	

CAUTION: When the Amplifier Limiting meters turn red or orange, the loudspeaker may distort due to clipping and exhibit nonlinear driver operation. Routinely operating a loudspeaker at this level may compromise the life span of its amplifier and drivers. Intermittent limiting (when the meters are lit for two seconds or less) will generally not harm the loudspeaker. Since each loudspeaker behaves differently when limiting is encountered, consult the loudspeaker's operating instructions for information on limiting capabilities.

Text View

Text View is the most complete monitoring view in RMS, with a host of important data displayed in text fields.



Text View for MILO Loudspeaker

TIP: Text Views can be closed by clicking the Close button in the lower right corner.

Table 5 provides a list of the parameters for the MILO high-power curvilinear array loudspeaker when in Text View.

Table 5: Text View Parameters for MILO Loudspeaker

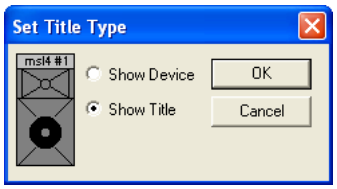
Parameter	Function	
Amplifier Peak Voltage (Vpk)	For each amplifier channel, the peak voltage (0–100 V)	
Amplifier Average Voltage (Vave)	For each amplifier channel, the average voltage (0–100 V)	
Amplifier Peak Power (Wpk)	For each amplifier channel, the peak power output in watts	
Amplifier Limiting	For each amplifier channel, the percentage of limiting	
Amplifier Temperature	The upper and lower heat sink temperatures	
Fan Speeds	Amplifier cooling fans: primary and reserve	
Input Signal Level	Measures 0–10 V and indicates the following conditions:	
	Green	0 < Signal Level < 8 V
	Yellow	8 < Signal Level < 9 V
	Red	9 < Signal Level < 10 V
Input Polarity	+2	Pin 2 hot (No Polarity switch for the MILO)
DC Headroom	Should be over 17 V DC when the AC mains voltage is sufficient	
Communication Status Indicator	Green	Loudspeaker commissioned and online
	Red	Loudspeaker not commissioned or offline
Service Pin	Displays “service pin” when the Service button is pressed on the loudspeaker’s RMS user panel.	
Fault	Indicates loudspeaker faults and abnormal operating conditions	
Mute Button	Green	Not muted
	Red	Muted
Solo Button	Gray	Not soloed
	Yellow	Soloed
Wink	Gray	Not winked
	Green	Winked

Displaying Loudspeaker Names

By default, loudspeakers are displayed in panels with the names entered when loudspeaker are added. You can instead choose to display loudspeaker device names.

To set the loudspeaker name:

1. Choose **Options > Title**.
2. In the Set Title Type dialog box, select one of the following options:



- **Show Device:** Displays loudspeakers with their device names.
- **Show Title:** Displays loudspeakers with the name entered when the loudspeakers are added.

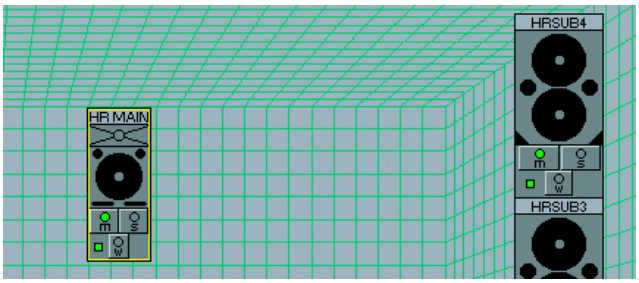
3. Click **OK**.

WORKING WITH LOUDSPEAKER ICONS

Selecting Loudspeakers

To select a loudspeaker, do one of the following:

- Click anywhere on the loudspeaker icon (except on the Mute, Solo, and Wink buttons). The selected loudspeaker becomes outlined in yellow.
- Draw a rectangle around the entire loudspeaker icon. The selected loudspeaker becomes outlined in yellow.



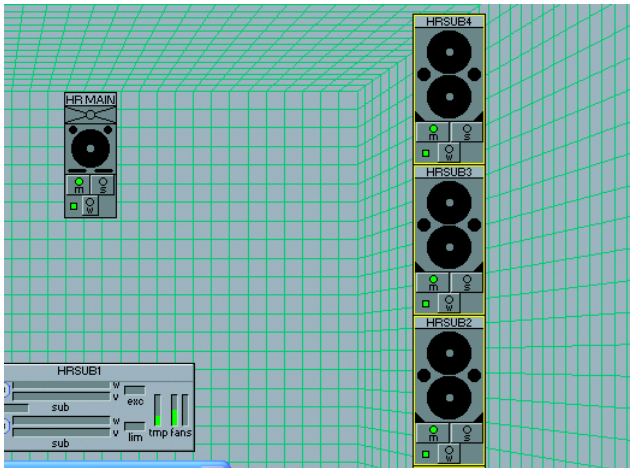
Selecting a single loudspeakers

⚠ **CAUTION:** When selecting loudspeakers, make sure not to click the Mute, Solo, or Wink buttons. This will instead activate those functions, if enabled, and not select the loudspeaker.

Selecting Multiple Loudspeakers

To select multiple loudspeakers, do one of the following:

- Shift-click each loudspeaker icon you want to select. The selected loudspeakers become outlined in yellow.
- Draw a rectangle around any loudspeaker icons you want to select. The selected loudspeakers become outlined in yellow.



Selecting multiple loudspeakers

CAUTION: When selecting loudspeakers, make sure not to click the Mute, Solo, or Wink buttons. This will instead activate those functions, if enabled, and not select the loudspeaker.

Moving Loudspeakers

Selected loudspeakers can be moved by either dragging them or by using the Arrow keys on your computer keyboard. Since Meter and Text views are not moved along with the loudspeakers, you might want to close those views before moving the loudspeakers.

To move the selected loudspeakers, do one of the following:

- Left-click a loudspeaker icon (or its title bar) and drag it to a new location in the panel. If multiple loudspeakers are selected, all selected speakers are moved.
- Press any of the Arrow keys to move the selected speakers in that direction in 5-pixel increments.

Locating Off-Screen Loudspeakers

If when opening a panel file some of the loudspeaker icons are located off-screen, you are prompted to relocate the loudspeakers to the upper left of the screen. This may be necessary if the panel was created on a computer with a higher screen resolution.

THE MUTE, SOLO, AND WINK BUTTONS

RMS provides Mute, Solo, and Wink buttons in Icon View, Small Icon View, and Text View. The Mute and Solo buttons are useful for troubleshooting during setup and configuration of the system. The Wink button identifies the physical loudspeaker corresponding to a loudspeaker icon in an RMS panel.

NOTE: Mute and Solo buttons are only available when they are enabled in the Muting Options dialog box (see “Muting Options” on page 50). In addition, muting and soloing is only possible with loudspeakers that have the Mute Jumper installed (see “Installing the Mute Jumper” on page 15).

Muting Loudspeakers with the Mute Button

The Mute button silences the output of a loudspeaker, which is useful when trying to isolate the output of certain loudspeakers during setup and configuration. Multiple loudspeakers can be muted.

To mute a loudspeaker with the Mute button:

1. In Icon View, Small Icon View, or Text View, click the loudspeaker’s **Mute** button. The loudspeaker is muted and the Mute button LED turns red.

2. Click the **Mute** button again to unmute the loudspeaker. The loudspeaker is unmuted and the Mute LED button turns green.

Soloing Loudspeakers with the Solo Button

The Solo button silences the output of all other loudspeakers, so you hear only the output from the soloed loudspeaker. Only one loudspeaker can be soloed at a time.

To solo a loudspeaker with the Solo button:

1. In Icon View, Small Icon View, or Text View, click the loudspeaker's **Solo** button. The loudspeaker is soloed and the Solo button LED turns yellow. All other loudspeakers are muted.

2. Click the **Solo** button again to unsolo the loudspeaker. The loudspeaker is unsoloed and the Solo button LED turns gray. All other loudspeakers are unmuted.

NOTE: Only one loudspeaker can be soloed at a time. If you click a Solo button while another loudspeaker is already soloed, only the new loudspeaker is soloed.

Winking Loudspeakers with the Wink Button

The wink function lets you identify the physical loudspeaker corresponding to a loudspeaker icon in an RMS panel.

To wink a loudspeaker with the Wink button:

1. In Icon View, Small Icon View, or Text View, click the loudspeaker's **Wink** button. The green Wink LED on the loudspeaker's RMS user panel lights up and the Wink button LED on the loudspeaker views in the RMS program also turns green.
2. Click the **Wink** button again to unwink the loudspeaker. The green Wink LED on the loudspeaker's RMS user panel turns off and the Wink button LED on the loudspeaker views in the RMS program turns gray.

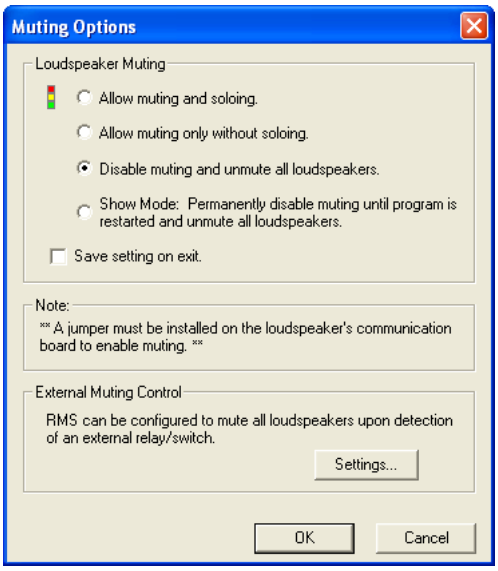
TIP: You can use the Service button on the loudspeaker's RMS user panel to identify its corresponding loudspeaker icon in an RMS panel. When a loudspeaker's Service button is pressed, a yellow "smiley face" icon appears on the loudspeaker views in the RMS panel.

MUTING OPTIONS

The Muting Options dialog box determines whether loudspeakers can be muted and soloed.

To configure Muting options:

1. Choose **Muting > Settings**. The Muting Options dialog box opens.


Muting Options
Loudspeaker Muting
Allow muting and soloing.
Allow muting only without soloing.
Disable muting and unmute all loudspeakers.
Show Mode: Permanently disable muting until program is restarted and unmute all loudspeakers.
Save setting on exit.
Note:
** A jumper must be installed on the loudspeaker's communication board to enable muting. **
External Muting Control
RMS can be configured to mute all loudspeakers upon detection of an external relay/switch.
Settings...
OK
Cancel

2. Select one of the following options:

- **Allow muting and soloing:** Loudspeakers can be muted and soloed by clicking their Mute and Solo buttons.
- **Allow muting only without soloing:** Loudspeakers can be muted but not soloed. This ensures that a loudspeaker cannot be accidentally soloed during a performance. When this option is selected, Solo buttons are dimmed.
- **Disable muting and unmute all loudspeakers:** Disables muting and soloing for all loudspeakers (and unmutes any loudspeakers currently muted). When this option is selected, Mute and Solo buttons are dimmed.
- **Show Mode:** Disables muting and soloing for the duration of the RMS session (and unmutes any loudspeakers currently muted). When this option is selected, Mute and Solo buttons are dimmed.

3. To save the Muting options for future RMS sessions, select **Save setting on exit**.
4. Click **OK**.

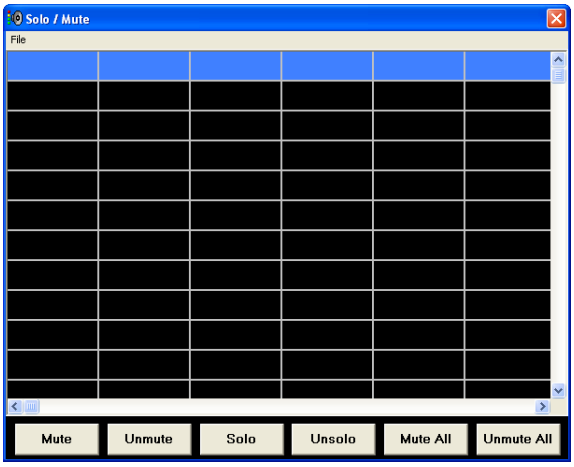
THE SOLO/MUTE MATRIX

The Solo/Mute Matrix manages muting and soloing for large numbers of loudspeakers. Up to 10 columns of 30 loudspeakers (a total of 300 loudspeakers) can be added to the matrix.

NOTE: Muting and soloing in the Solo/Mute Matrix is only available when muting and soloing are enabled in the Muting Options dialog box (see "Muting Options" on page 50). In addition, muting and soloing is only possible with loudspeakers that have the Mute Jumper installed (see "Installing the Mute Jumper" on page 15).

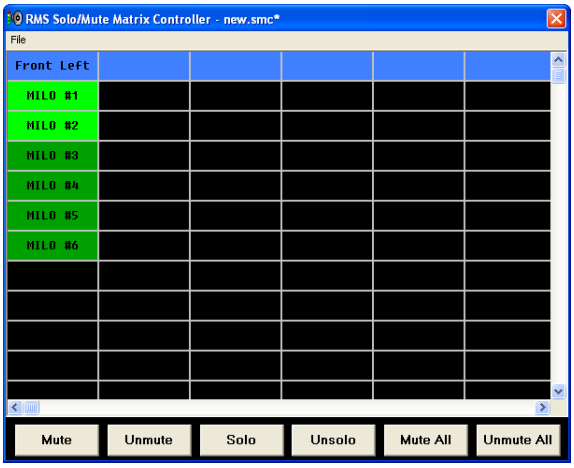
To use the Solo/Mute Matrix:

1. Choose **Muting > Solo/Mute Matrix Controller**. The Matrix Controller opens.



2. To name a column, right-click a column head and choose **Name Column**. In the Name Control Column dialog box, enter a name for the column and click **OK**.

3. To add loudspeakers to the matrix, right-click a cell and choose **Add**. In the Loudspeaker Selector dialog box, select one or more loudspeakers and click **Add**.



TIP: You can add the same loudspeaker multiple times to the matrix, thereby allowing the loudspeaker to belong to different columns.

4. To delete a loudspeaker from the matrix, right-click the loudspeaker cell and choose **Remove**.

5. If there are empty cells in a column and you want to shift all loudspeaker cells up in the column, right-click the column head and choose **Shift Entries Up**.

6. To select loudspeakers that will be muted or soloed:

- Click a cell to select a single loudspeaker. The cell for the selected loudspeaker turns bright green.
- Shift-click multiple cells to select multiple, consecutive loudspeakers. The cells for the selected loudspeakers turn bright green.
- Ctrl-click multiple cells to select multiple, discontiguous loudspeakers. The cells for the selected loudspeakers turn bright green.
- Click a column head to select all loudspeakers in the column. The cells for the selected loudspeakers turn bright green.
- Click and drag in the matrix, either vertically or horizontally, to select multiple, consecutive loudspeakers. The cells for the selected loudspeakers turn bright green.

7. To mute and solo loudspeakers.

- Click **Mute** to mute the selected loudspeakers. The cells for the muted loudspeakers turn red.
- Click **Unmute** to unmute the selected loudspeakers. The cells for the unmuted loudspeakers turn bright green.
- Click **Mute All** to mute all loudspeakers.

NOTE: When all loudspeakers are muted, you are prompted with an RMS Warning.

- Click **Unmute All** to unmute all loudspeakers.
- Click **Solo** to solo the selected loudspeaker. The cell for the soloed loudspeaker turns yellow.

OPTIMIZED MUTING

For extremely large systems with many loudspeakers, muting and unmuting all loudspeakers (or large numbers of multiple loudspeakers) may encounter a small delay before the loudspeakers are muted. This delay can be minimized when Optimized Muting is enabled in the RMS Network Server and Manager. Once enabled, the loudspeakers in the RMS network databases are optimized to allow for more efficient muting.

To enable Optimized Muting:

- In the RMS Network Server and Manager, select **Tools > Optimized Muting > Enabled**.

NOTE: Optimized Muting is disabled by default.

UX ATTENUATION RANGE

Choose **Options > UX Attenuation Range** to open a dialog box where you can set the amplifier attenuation range for all UltraSeries loudspeakers. You can set the range to 0–18 dB or 0–12 dB.

TIP: All Meyer Sound loudspeakers that use a UX or UPM amplifier are affected by the UX Attenuation Range setting.

APPENDIX A: RMS KEYBOARD SHORTCUTS

The RMS software includes the following keyboard shortcuts.

Command	Shortcut
New Panel	Ctrl+N
Open Panel	Ctrl+O
Save Panel	Ctrl+S
Add Page	Ctrl+A
Delete Page	Ctrl+D
Rename Page	Ctrl+R
Muting Options	Ctrl+M
Background	Ctrl+B
Network Setup	Ctrl+C
Title	Ctrl+T
Mute All	F12
Unmute All	F9
Solo/Mute Matrix Controller	F8
Scroll through Pages (left to right)	Tab
Scroll through Pages (right to left)	Shift+Tab

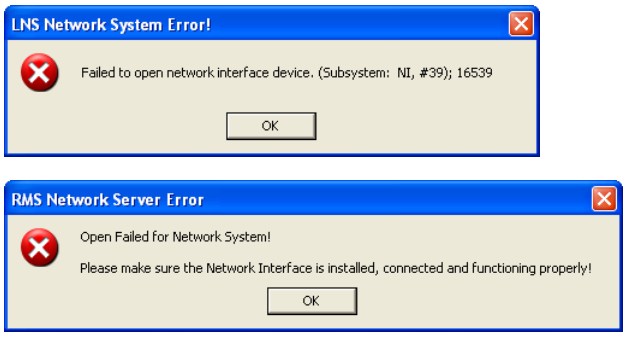
APPENDIX B: TROUBLESHOOTING RMS SOFTWARE PROBLEMS

This chapter documents troubleshooting for the RMS software and includes the following topics:

- "Troubleshooting Network Systems Errors When Launching RMS" on page 55
- "Troubleshooting the U10 USB Network Interface Adapter" on page 58
- "Testing Network Interface Cards" on page 60
- "Completely Removing RMS" on page 60
- "Is the POET 6.0 Object Server Installed?" on page 61
- "Disabling Startup Items" on page 62
- "Checking System Resources with Task Manager" on page 62

TROUBLESHOOTING NETWORK SYSTEMS ERRORS WHEN LAUNCHING RMS

If you encounter a network system error when launching the RMS program, the IP address for your computer and i.LON 10 may not match, or there may be an IP address conflict with another device on the network. You can verify your computer's IP address with the Windows IP Configuration utility. You can verify the i.LON 10 IP address with the LonWorks Interfaces control panel.


LNS Network System Error!
Failed to open network interface device. (Subsystem: NI, #39); 16539
OK
RMS Network Server Error
Open Failed for Network System!
Please make sure the Network Interface is installed, connected and functioning properly!
OK

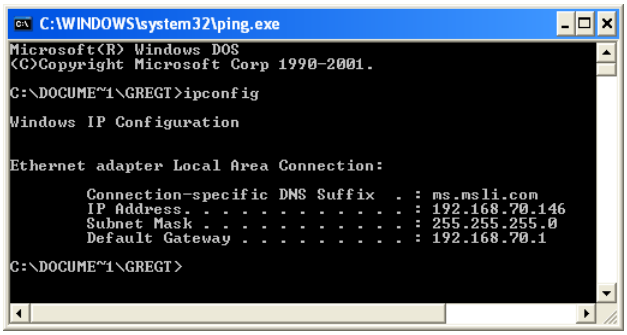
RMS Startup Errors

Another cause of network system errors is network congestion, which can be tested with the Ping command.

Verifying your Computer's IP Address

To verify your computer's IP address:

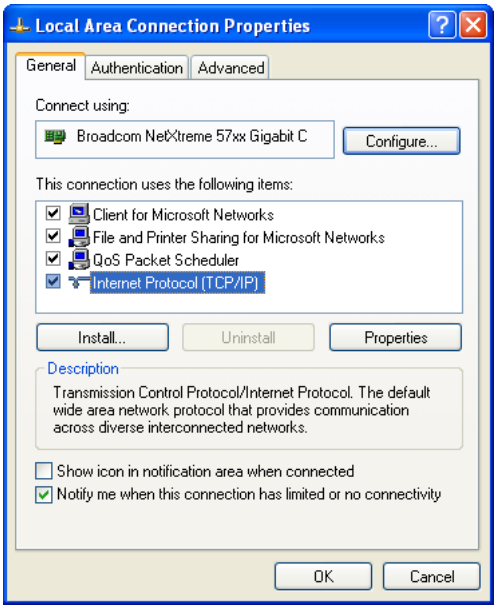
1. From the Windows taskbar, choose **Start > Run**.
2. In the Run dialog box, enter "command" and click **OK**.
3. In the Command window, type "ipconfig" and then press **Enter**. The computer's IP address, subnet mask, and default gateway are returned.


C:\WINDOWS\system32\ping.exe
Microsoft(R) Windows DOS
(C)Copyright Microsoft Corp 1990-2001.
C:\DOCUME~1\GREGT>ipconfig
Windows IP Configuration
Ethernet adapter Local Area Connection:
Connection-specific DNS Suffix . : ms.msli.com
IP Address. . . . . : 192.168.70.146
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.70.1
C:\DOCUME~1\GREGT>

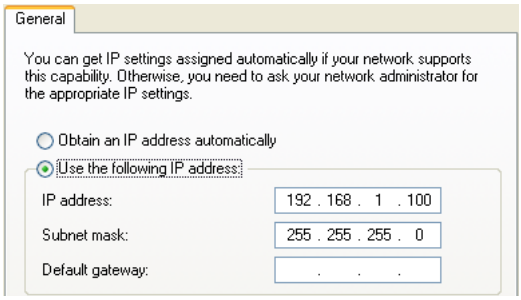
4. If the computer's IP address range does not match the i.LON 10 and you want to change the address for the computer, do the following:

- If you are using Windows XP:
  - From the Windows taskbar, choose **Start > Control Panel**.
  - In the Control Panel window, open the **Network Connections** control panel and then double-click **Local Area Connections**.
  - In the Local Area Connection Status dialog box, click **Properties**.

– In the Local Area Connection Properties dialog box, on the General tab, select **Internet Protocol (TCP/IP)** and click **Properties**.



– In the Internet Protocol (TCP/IP) Properties dialog box, select “Use the Following IP Address” and enter the new address in the **IP Address** field. Make sure to use an IP address that is not in use by another computer on the network. Accept the default Subnet Mask value. Click **OK**.


General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address: 192 . 168 . 1 . 100
Subnet mask: 255 . 255 . 255 . 0
Default gateway:

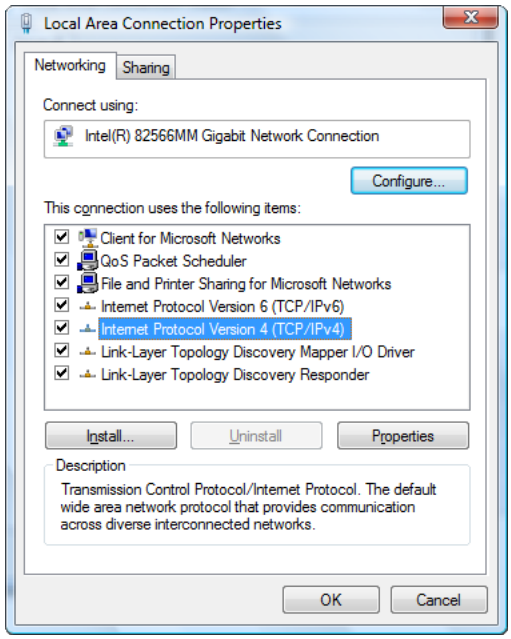
■ If you are using Windows Vista:

– From the Windows taskbar, choose **Start > Control Panel**.

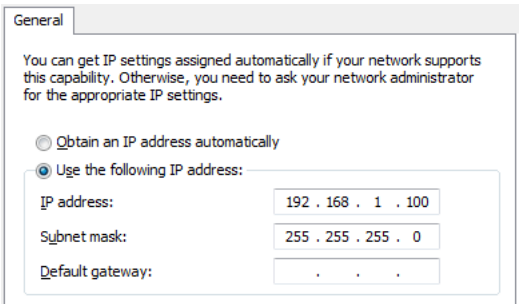
– In the Control Panel window, open the **Network and Sharing Center** control panel and then click **Mange Network Connections**.

– In the Network Connections dialog box, right-click **Local Area Connection** and choose **Properties**.

– In the Local Area Connection Properties dialog box, on the Networking tab, select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**.



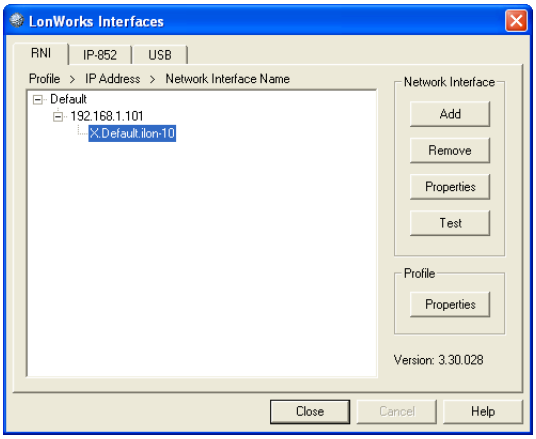
– In the Internet Protocol Version 4 (TCP/IPv4) Properties dialog box, select “Use the Following IP Address” and enter the new address in the **IP Address field**. Make sure to use an IP address that is not in use by another computer on the network. Accept the default Subnet Mask value. Click **OK**.


General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address: 192 . 168 . 1 . 100
Subnet mask: 255 . 255 . 255 . 0
Default gateway:

Verifying the i.LON 10's IP Address

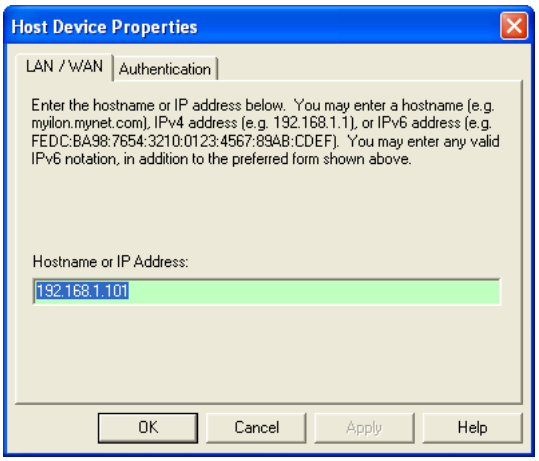
To verify the i.LON 10's IP address:

1. From the Windows taskbar, choose **Start > Control Panel**.
2. In the Control Panel window, open the **LonWorks Interfaces** control panel. The i.LON 10's IP address is displayed on the RNI tab.



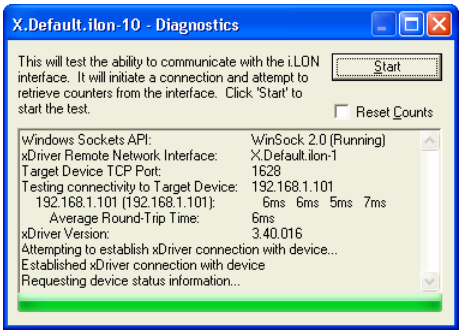
3. If the i.LON 10's IP address range does not match the computer and you want to change the address for the i.LON 10, do the following:

- Select the i.LON 10 name and in the Network Interface section click **Properties**.
- In the Network Interface Properties dialog box, click **RNI Device**.
- In the Host Device Properties dialog box, enter the new IP address and click **OK**. Make sure to use an IP address that is not in use by another i.LON 10 or another computer on the network.


Host Device Properties
LAN / WAN
Authentication
Enter the hostname or IP address below. You may enter a hostname (e.g. myilon.mynet.com), IPv4 address (e.g. 192.168.1.1), or IPv6 address (e.g. FEDC:BA98:7654:3210:0123:4567:89AB:CDEF). You may enter any valid IPv6 notation, in addition to the preferred form shown above.
Hostname or IP Address:
192.168.1.101
OK
Cancel
Apply
Help

4. To verify the connection for the i.LON 10, do the following:

- In the LonWorks Interfaces control panel, select the i.LON 10 name and click **Test**.
- In the i.LON 10 Diagnostics dialog box, click **Start**. The connection to the i.LON 10 is established and a status is returned along with connection times.


X.Default.ilon-10 - Diagnostics
This will test the ability to communicate with the i.LON interface. It will initiate a connection and attempt to retrieve counters from the interface. Click 'Start' to start the test.
Start
Reset Counts
Windows Sockets API: WinSock 2.0 (Running)
xDriver Remote Network Interface: X.Default.ilon-1
Target Device TCP Port: 1628
Testing connectivity to Target Device: 192.168.1.101
192.168.1.101 (192.168.1.101): 6ms 6ms 5ms 7ms
Average Round-Trip Time: 6ms
xDriver Version: 3.40.016
Attempting to establish xDriver connection with device...
Established xDriver connection with device
Requesting device status information...

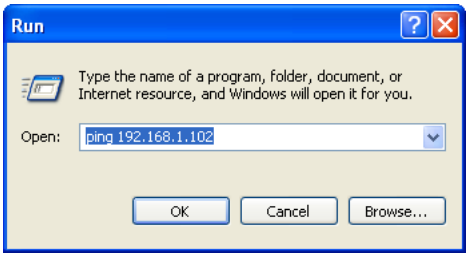
Using the Ping Command

The Ping command can be used to verify the connection between the RMS host computer and the network hardware. The Ping command also measures the speed of the response times.

To use the Ping command:

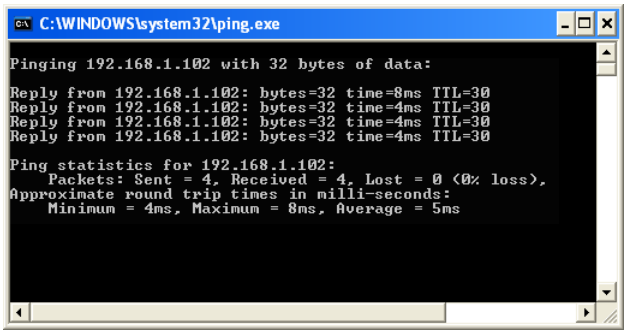
1. From the Windows taskbar, choose **Start > Run**.
2. In the Run dialog box, enter the following and click **OK**.

   ping [IP address]

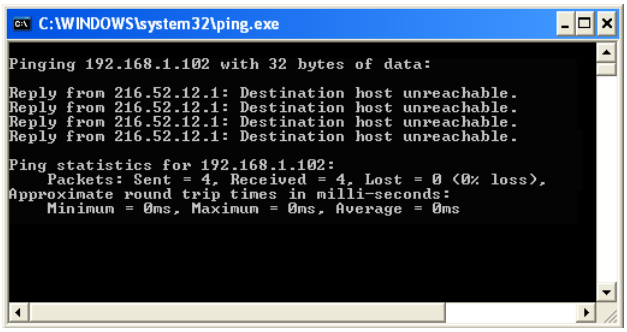


The Command window opens and the Ping command is sent. Below are some of the more common results that may be encountered.

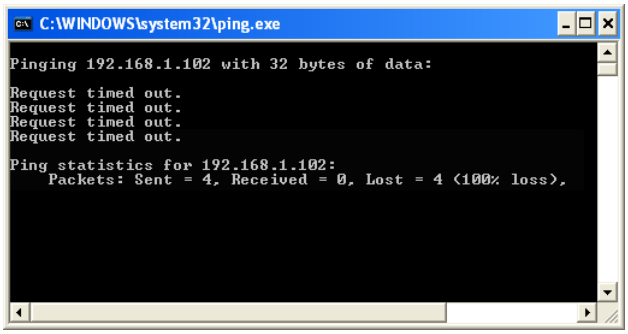
- The following example illustrates when the Ping command was returned successfully. The time for the Ping is indicated in milliseconds. Long return times can be caused by network congestion.


C:\WINDOWS\system32\ping.exe
Pinging 192.168.1.102 with 32 bytes of data:
Reply from 192.168.1.102: bytes=32 time=8ms TTL=30
Reply from 192.168.1.102: bytes=32 time=4ms TTL=30
Reply from 192.168.1.102: bytes=32 time=4ms TTL=30
Reply from 192.168.1.102: bytes=32 time=4ms TTL=30
Ping statistics for 192.168.1.102:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 4ms, Maximum = 8ms, Average = 5ms

- The following example illustrates when the Ping command cannot reach its intended address, usually indicating an incorrect IP address or a bad network connection.


C:\WINDOWS\system32\ping.exe
Pinging 192.168.1.102 with 32 bytes of data:
Reply from 216.52.12.1: Destination host unreachable.
Reply from 216.52.12.1: Destination host unreachable.
Reply from 216.52.12.1: Destination host unreachable.
Reply from 216.52.12.1: Destination host unreachable.
Ping statistics for 192.168.1.102:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms

- The following example illustrates when the Ping command was not returned in the allowed time. Ping timeouts generally indicate a problem with the network, such that the network hardware is incorrectly configured, not powered on, or not connected.


C:\WINDOWS\system32\ping.exe
Pinging 192.168.1.102 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 192.168.1.102:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

TROUBLESHOOTING THE U10 USB NETWORK INTERFACE ADAPTER

If a Single U10 Stops Working

If you are using a single U10 USB network interface adapter and it stops working (this may happen if you unplug and plug in the device several times), you should unplug the U10, delete it from the LonWorks Interfaces control panel and Windows Device Manager, and then plug it back in (see “Uninstalling the U10” on page 58). You can then use the LonWorks Interfaces control panel to verify the device is installed correctly (see “Verifying the Connection to the U10” on page 59).

Working with Multiple U10s

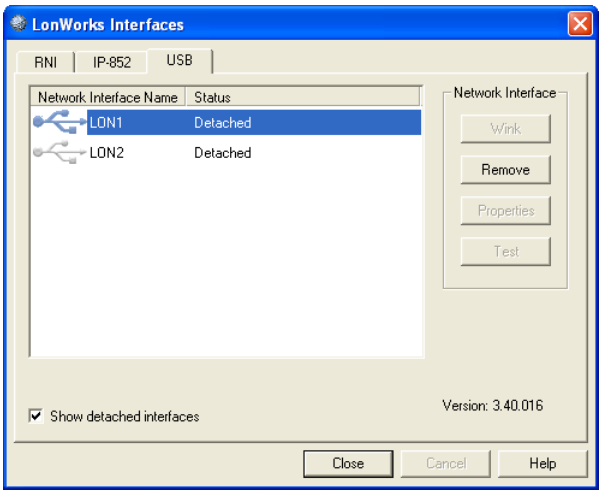
When you have more than one U10 USB network interface attached to your computer, the LonWorks Interfaces control panel assigns unique IDs to each interface (LON1, LON2, etc.). This may cause RMS to lose communication with the U10 (RMS will only recognize the LON1 device). If you encounter this situation, unplug all U10 devices and uninstall the devices from the LonWorks Interfaces control panel and Windows Device Manager (see “Uninstalling the U10” on page 58). You can then plug in the U10 you want to use with RMS and verify its connection with the LonWorks Interfaces control panel (see “Verifying the Connection to the U10” on page 59).

Uninstalling the U10

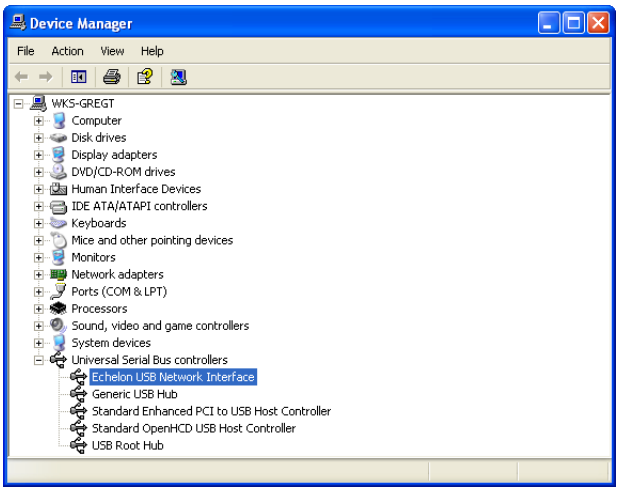
To uninstall the U10 device:

1. Unplug all U10 USB network interfaces from your computer.
2. From the Windows taskbar, choose **Start > Control Panel**.
3. In the Control Panel window, open the **LonWorks Interfaces** control panel and click the **USB** tab.

4. Select the LON1 interface and click **Remove**. Repeat for any additional interfaces.



5. In the Control Panel window, open the **System** control panel and click the **Hardware** tab, then click **Device Manager**.
6. In the Device Manager window, in the device list, expand the Universal Serial Bus Controllers list, select “Echelon USB Network Interface,” and choose **Action > Uninstall**.

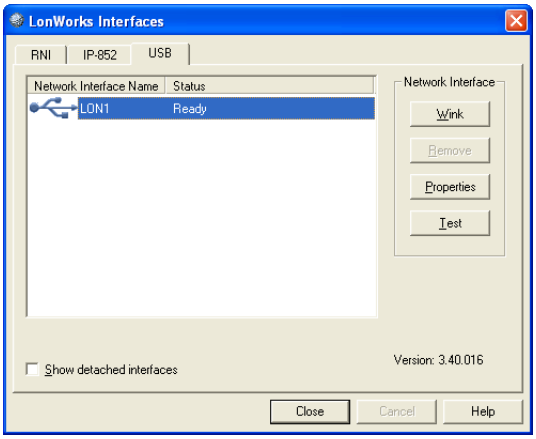


7. When prompted to confirm the device removal, click **OK**.
8. Plug in the U10 USB network interface you want to use with RMS. Do not plug in any additional devices.

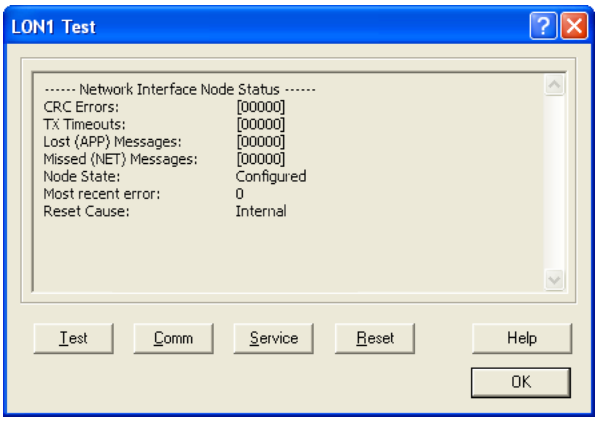
Verifying the Connection to the U10

To verify the connection to the U10:

1. From the Windows taskbar, choose **Start > Control Panel**.
2. In the Control Panel window, open the **LonWorks Interfaces** control panel and click the **USB** tab.



3. Select the LON1 interface and click **Test**.
4. In the U10 Test dialog box, click **Test**. The connection to the U10 is verified and a status is returned along with any errors.



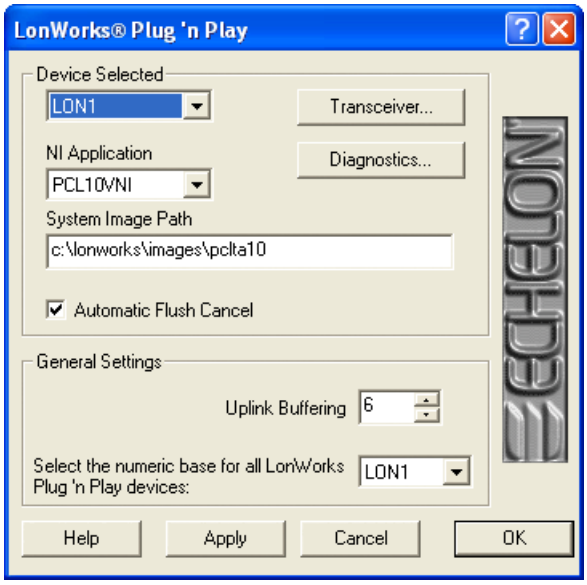
5. Click **OK** to close the U10 Test dialog box.

TESTING NETWORK INTERFACE CARDS

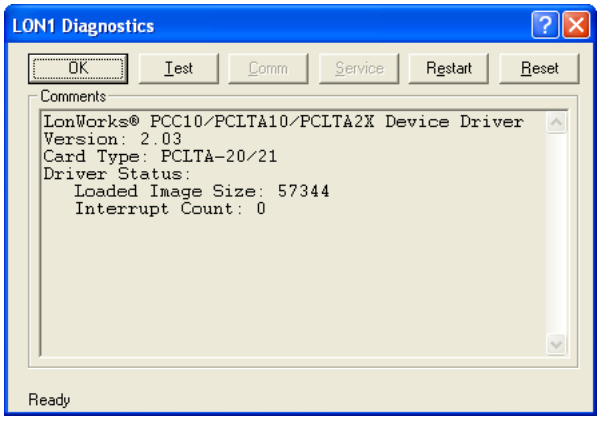
You can use the LonWorks Plug'n Play control panel to test the LonWorks network interface cards (PCLTA-21, PCLTA-20, and PCC-10).

To test the LonWorks network interface card:

1. From the Windows taskbar, choose **Start > Control Panel**.
2. In the Control Panel window, open the **LonWorks Plug'n Play** control panel and click **Diagnostics**.



3. In the Diagnostics dialog box, click **Test**. The connection status of the card is tested and the results are displayed. The results should be similar to those in the following figure.



NOTE: If you encounter any error messages, click **Restart** and **Reset** to reset the card and reload its firmware, then click **Test** again.

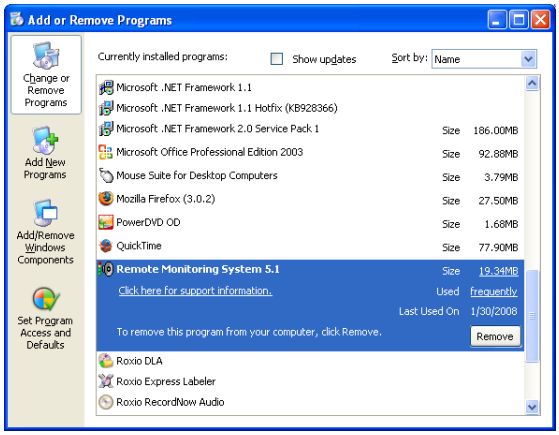
4. Click **OK** to close the Diagnostics dialog box.
5. Click **OK** to close the LonWorks Plug'n Play control panel.

COMPLETELY REMOVING RMS

If you are having trouble installing or upgrading the RMS software, it may be necessary to completely remove the existing RMS software before reinstalling.

To completely remove the RMS software:

1. From the Windows taskbar, choose **Start > Control Panel**.
2. In the Control Panel window, open the **Add or Remove Programs** control panel and remove the following items:



- Remote Monitoring System
- Echelon LNS Server
- Echelon OpenLDV

3. If necessary, back up any existing RMS network databases and panel files. In Windows Explorer, navigate to the **C:\meyer\rms** folder on your hard drive and copy the following items to another location on your hard drive, or onto a backup disc or other storage media:

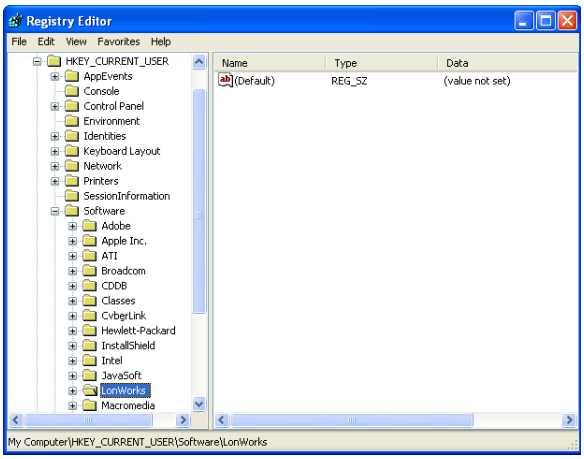
- Any panel files with a .pnl extension
- Any folders named RMSNET, including those with numerals (RMSNET1, RMSNET2, etc.)

4. In Windows Explorer, delete the following items:

- C:\meyer\rms directory
- C:\LonWorks directory
- C:\WINDOWS\rms.ini file

5. Remove the LonWorks entries from the Registry:

- Choose **Start > Run**.
- In the Run dialog box, enter “regedit” and click **OK**. The Registry Editor opens.
- Select the “HKEY_CURRENT_USER/Software/Lonworks” folder and choose **Edit > Delete**.

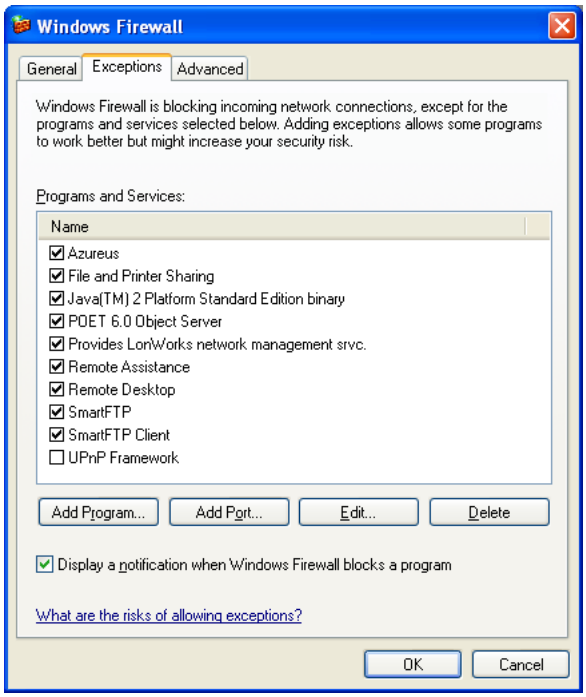


- Select the “HKEY_LOCAL_MACHINES/Software/Lonworks” folder and choose **Edit > Delete**.
- Choose **File > Exit** to close the Registry Editor.

6. Restart Windows.

IS THE POET 6.0 OBJECT SERVER INSTALLED?

If you are having problems with the RMS software, verify that the POET 6.0 Object Server is installed. Once you have installed RMS and successfully launched the RMS program, “POET 6.0” should be listed in the Windows Firewall control panel on the Exceptions tab.



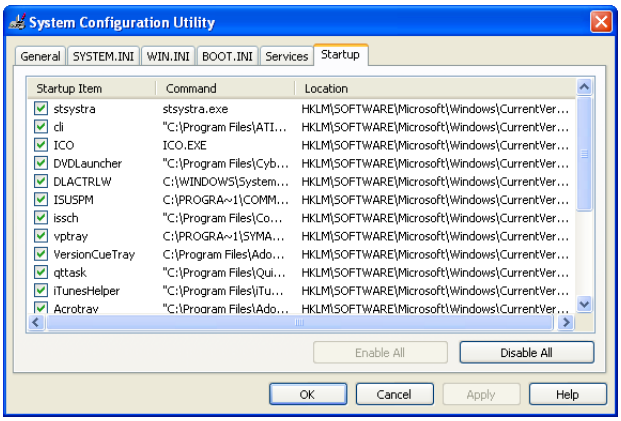
Windows Firewall Control Panel

DISABLING STARTUP ITEMS

If there are startup items conflicting with RMS you can disable them with the System Configuration Utility.

To disable startup items:

1. From the Windows taskbar, choose **Start > Run**.
2. In the Run dialog box, enter “msconfig” and click **OK**.
3. In the System Configuration Utility, on the Startup tab, deselect the startup items you want to disable and click **OK**.



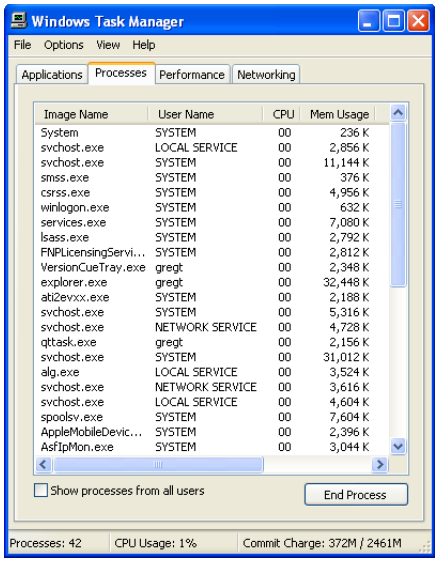
4. Restart Windows when prompted.

CHECKING SYSTEM RESOURCES WITH TASK MANAGER

You can use the Windows Task Manager to view how much CPU and memory resources are being used by the programs and task currently running.

To check system resources with Task Manager:

1. Press **Ctrl+Alt+Delete**.
2. In the Windows Security dialog box, click **Task Manager**.
3. In the Windows Task Manager, check the **Mem Usage** and **VM Size** columns to see which applications or tasks may be draining resources.



4. To end a task, select the task and click **End Process**.
5. Choose **File > Exit Task Manager** to close the Task Manager.

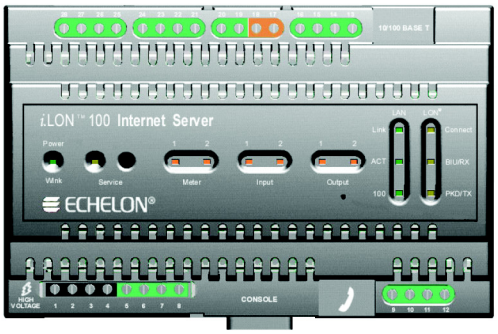
APPENDIX C: EXTERNAL MUTING WITH THE I.LON 100

This chapter documents using the i.LON 100 for external muting and includes the following topics:

- "Fire Alarm External Muting" on page 63
- "Wiring the i.LON 100 for External Muting" on page 63
- "Commissioning the i.LON 100" on page 63

FIRE ALARM EXTERNAL MUTING

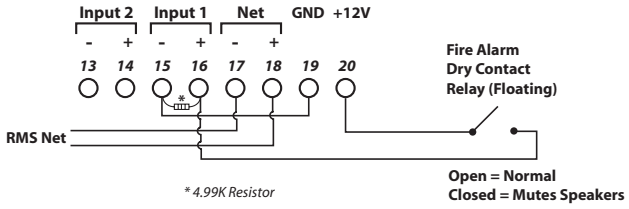
To ensure safety at venues with high-level sound reinforcement, some venues require automatic muting of audio systems when a fire alarm or other emergency signal is triggered. The i.LON 100 Ethernet Adapter can be configured for external muting of RMS loudspeakers when a fire alarm or external relay is triggered.



i.LON 100 Ethernet Adapter

WIRING THE I.LON 100 FOR EXTERNAL MUTING

To enable muting of loudspeakers from a fire alarm or relay contact, the i.LON 100 should be wired as follows:



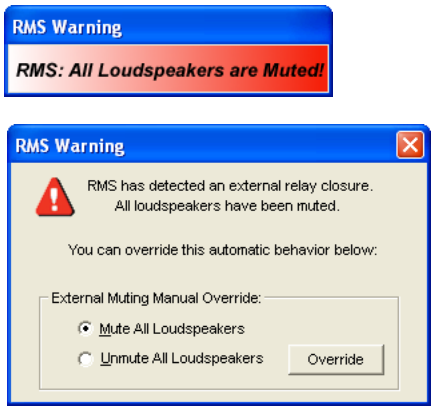
Wiring Diagram for i.LON 100 Fire Alarm Muting

1. Connect the RMS two-wire connections to positions 17 and 18.
2. Connect a jumper wire (approximately 0 ohms of resistance) between positions 15 and 19 (the Ground connection on the i.LON 100).
3. Connect a 4.99 K resistor between positions 15 and 16.

   NOTE: This resistor stabilizes connections to prevent false triggering of the muting command sent to the loudspeakers.

4. Connect a wire between position 16 and the closure side of the fire alarm dry contact relay (floating).
5. Connect a wire between position 20 (the +12 V connection on the i.LON 100) and the relay trigger side of the fire alarm dry contact relay (floating).

When the relay is open, the RMS network operates normally with the loudspeakers outputting audio. When the relay is closed by a triggering event, a mute command is sent to all loudspeakers on the RMS network (connected to the i.LON 100). When the relay is reopened, the loudspeakers are unmuted.



RMS Warning Dialog Boxes

NOTE: To respond to muting commands from RMS, loudspeakers must have muting enabled (the Mute Jumper installed on their RMS module).

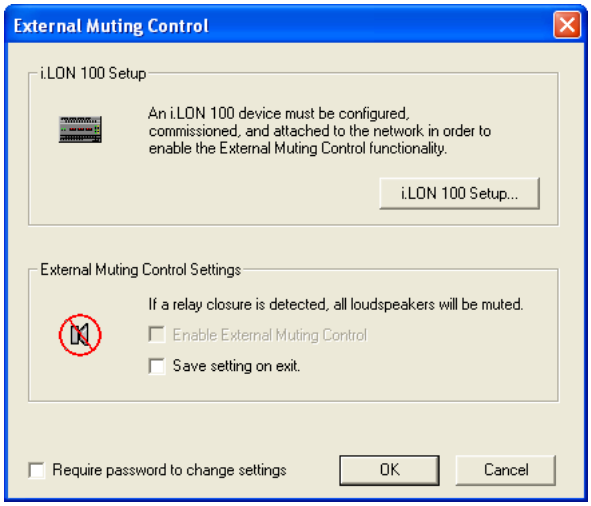
COMMISSIONING THE I.LON 100

To enable external muting for an i.LON 100 in RMS, the i.LON 100 must be commissioned.

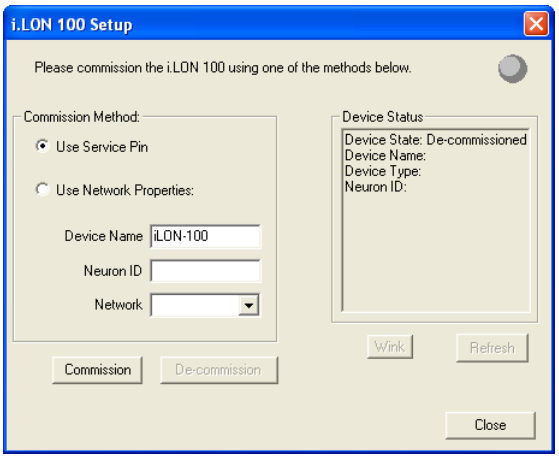
To commission the i.LON 100:

1. In the RMS program, choose **Muting > Options**.
2. In the Muting Options dialog box, under External Muting Control, click **Settings**.

3. In the External Muting Control dialog box, click **i.LON 100 Setup**.


External Muting Control
i.LON 100 Setup
An i.LON 100 device must be configured, commissioned, and attached to the network in order to enable the External Muting Control functionality.
i.LON 100 Setup...
External Muting Control Settings
If a relay closure is detected, all loudspeakers will be muted.
Enable External Muting Control
Save setting on exit.
Require password to change settings
OK
Cancel

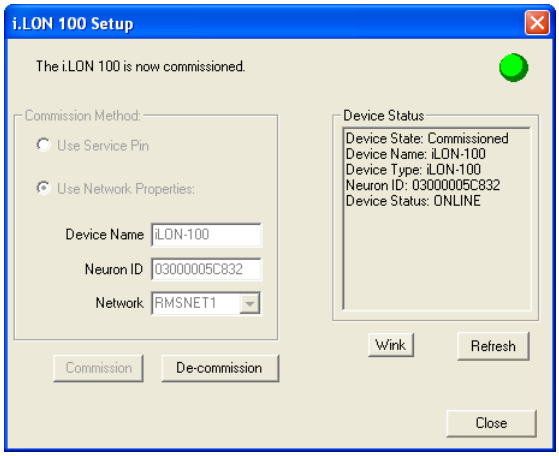
4. In the i.LON 100 Setup dialog box, do one of the following:



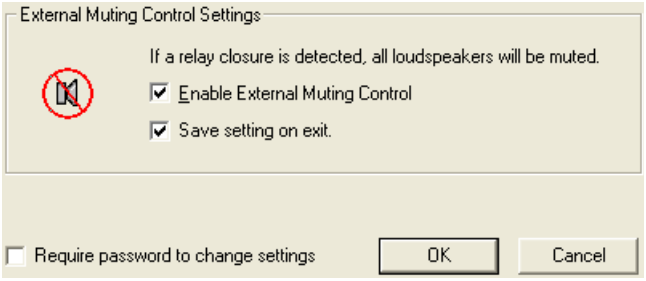
- To commission with the Service Pin:
  - Select the **Use Service Pin** option.
  - Leave the **Device Name** set to the default name (iLON-100).
  - Click **Commission**.
  - Press the Service Pin on the back of the i.LON 100. The i.LON 100 comes online.

  – or –

- To commission by entering the i.LON 100 Neuron ID:
  - Select the **Use Network Properties** option.
  - Leave the **Device Name** set to the default name (iLON-100).
  - Enter the **Neuron ID** for the i.LON 100 (located on the bottom of the unit).
  - Enter the RMS **Network** for the i.LON 100.
  - Click **Commission**. The i.LON 100 comes online.



5. Click **Close** to close the i.LON 100 Setup dialog box.
6. In the External Muting Control dialog box, make sure the following options are selected and then click **OK**.


External Muting Control Settings
If a relay closure is detected, all loudspeakers will be muted.
Enable External Muting Control
Save setting on exit.
Require password to change settings
OK
Cancel

- Enable External Muting Control
- Save Setting on Exit

NOTE: To password-protect any changes to the External Muting settings, select the option for "Require password to change settings," specify the **Password**, and click **OK**.

7. Click **OK** to close the Muting Options dialog box.

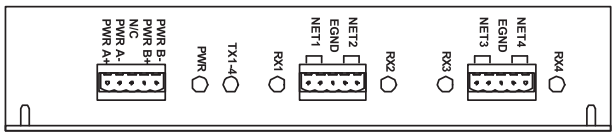
APPENDIX D: THE FTR-120 FREE TOPOLOGY REPEATER

This chapter documents the FTR-120 Free Topology Repeater and includes the following topics:

- "About the FTR-120" on page 65
- "Installing and Using the FTR-120" on page 65
- "FTR-120 Specifications" on page 66

ABOUT THE FTR-120

The FTR-120 is a four-channel network repeater. A message generated on any network segment to which the FTR-120 is connected is rebroadcasted on the three other channels.



FTR-120 Free Topology Repeater

There are six status LEDs on the unit:

- The PWR LED is the power indicator. It is lit if power is properly supplied to the unit.
- The other five LEDs give an indication of the amount of network traffic. The TX1-4 LED flashes whenever a message is transmitted by the repeater. The RX1, RX2, RX3, RX4 LEDs flash whenever a message is received on a particular channel.

For example, if a message is received on channel 1, the RX1 LED flashes, the message is transmitted on the other channels (2, 3, and 4), and the TX1-4 LED flashes.

NOTE: See Chapter 5, "Connecting RMS Networks" for design scenarios using the FTR-120 network repeater.

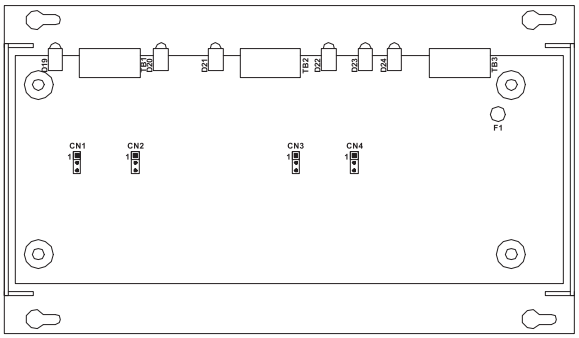
INSTALLING AND USING THE FTR-120

FTR-120 Physical Installation

The FTR-120 can be mounted on a wall or other surface using four #6 wood screws (or equivalent). It can be mounted horizontally with the terminal blocks facing down, or vertically with the terminal blocks on the right side. The FTR-120 unit and associated wiring should be mounted and fastened securely, so that no stress is incurred. Do not install the FTR-120 in a manner that would allow unanticipated disconnection.

FTR-120 Network Terminations

The FTR-120 is capable of providing standard network termination. As shipped, each channel on the unit has 5-ohm network termination resistors connected. If no termination or 100-ohm network termination is required, the top must be removed.



FTR-120 Jumper Layout

Network termination can be changed by moving the shorting jumper on CN1, CN2, CN3, or CN4. Table 6 describes the jumper positions.

Table 6: FTR-120 Jumper Settings

Channel Number	No Termination	5-ohm Termination	100-ohm Termination
CN1	No Jumper	Jump 1 and 2	Jump 2 and 3
CN2	No Jumper	Jump 1 and 2	Jump 2 and 3
CN3	No Jumper	Jump 1 and 2	Jump 2 and 3
CN4	No Jumper	Jump 1 and 2	Jump 2 and 3

When installing an FTR-120 network repeater on an RMS network, avoid using the twisted wire terminator (provided in the RMS peripheral kit) on the network output of the loudspeakers connected to the repeater unless the repeater terminator is removed. Double terminating any network output will decrease performance.

FTR-120 Wiring

The FTR-120 is wired using five position terminal blocks. The wiring pin-out for the FTR-120 module is shown in Table 7.

Table 7: FTR-120 Wiring Pin-Out

Pin Description	Function
PWR A+	Power A+ positive supply connection
PWR A-	Power A– negative supply connection
N/C	No connection (reserved)
PWR B+	Power B+ positive supply connection
PWR B–	Power B- negative supply connection
NET1	Network channel 1 connection
NET1	Network channel 1 connection
EGND	Earth ground
N/C	No connection (reserved)
NET2	Network channel 2 connection
NET2	Network channel 2 connection
NET3	Network channel 3 connection
NET3	Network channel 3 connection
EGND	Earth ground
N/C	No connection (reserved)
NET4	Network channel 4 connection
NET4	Network channel 4 connection

Power A+ and Power A– are the power supply inputs. Connect the positive lead of the power supply to the terminal block Power A+ and the negative lead of the power supply to the terminal block Power A–.

If a redundant supply is required, connect it to Power B+ and Power B–. Connect the positive lead of the redundant power supply to the terminal block Power B+ and the negative lead of the power supply to the terminal block Power B–.

Network 1-4 are the network connections. Network 1 is the channel 1 network connection. Connect the first network twisted pair to the terminal block NET1 positions. The wiring is polarity-independent so it does not matter which wire in the pair is connected to which position on the terminal block. Connect the rest of the network twisted pairs to the other channels. Leave any unused channels unconnected.

NOTE: Terminals labeled EGND should be connected to an earth ground.

The FTR-120 Universal Power Supply

The universal power supply included with the repeater kit allows for FTR-120 operation around the world. The supply accepts any input voltage from 100 to 240 V AC, and produces the required 12 V DC output. The male IEC input allows for any mains lead adapter to be used with the supply.

FTR-120 SPECIFICATIONS

Table 8: FTR-120 Specifications

Power Supply	+12 V DC to +24 V DC +/–10% @ 100 mA
PWR A+	Power A+ positive supply connection
PWR A–	Power A- negative supply connection
N/C	No connection (reserved)
PWR B+	Power B+ positive supply connection
PWR B–	Power B– negative supply connection
NET1	Network channel 1 connection
NET1	Network channel 1 connection
EGND	Earth ground
N/C	No connection (reserved)
NET2	Network channel 2 connection
NET2	Network channel 2 connection
NET3	Network channel 3 connection
NET3	Network channel 3 connection
EGND	Earth ground
N/C	No connection (reserved)
NET4	Network channel 4 connection
NET4	Network channel 4 connection

RMS CONFIGURATION SHEET

Customer Name _____ **Venue** _____ **Date** _____

Loudspeaker Model	Serial Number	Neuron ID #	Loudspeaker Name	Notes

RMS CONFIGURATION SHEET

Customer Name _____ **Venue** _____ **Date** _____

Loudspeaker Model	Serial Number	Neuron ID #	Loudspeaker Name	Notes

RMS CONFIGURATION SHEET

Customer Name _____ **Venue** _____ **Date** _____

Loudspeaker Model	Serial Number	Neuron ID #	Loudspeaker Name	Notes

RMS CONFIGURATION SHEET

Customer Name _____ **Venue** _____ **Date** _____

Loudspeaker Model	Serial Number	Neuron ID #	Loudspeaker Name	Notes

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thinking sound

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